









Journal
of the
Royal Naval Medical Service



Journal
of the
Royal Naval Medical Service

VOL. XLVI
1960

THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL,
ALVERSTOCKE HAMPSHIRE



Journal

of the

Royal Naval Medical Service

PUBLISHED QUARTERLY

(For Admiralty Advice and responsibility for the opinions expressed, see Editor's Foreword)

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THE STAFF OF THE ROYAL NAVAL MEDICAL SERVICE,
ALVERSTON, HAMPSHIRE.



THE ADOPTION OF THE METRIC SYSTEM BY THE
ROYAL MELBOURNE HOSPITAL¹

CHARLES E. MACCORMICK

It is about eight years since the medical profession and hospitals suggested the use of the Metric system, but little progress in implementing that change was given until after the end of World War II. The support given to the use of the Metric system in medicine has been evident in the post-war publications of the British Pharmacopoeia. In 1951 the British Pharmacopoeia adopted the doses of drugs in the Metric system over the Imperial equivalents and the tendency to change has been confirmed in the B.P. 1958. The introduction to the British Pharmacopoeia 1958 states: "Doses are expressed in the Metric system only except for those substances and preparations commonly prescribed in the Imperial system. The Committee has expressed the view that arrangements should be made so that the Imperial system of drugs, might be abandoned in the next edition of the Pharmacopoeia."

When in 1954 the Editorial Committee revised the Royal Melbourne Hospital Manual which includes the hospital pharmacopoeia, it decided that the Metric system would be adopted as soon as possible, for use in the hospital. All doses of drugs and amounts of preparations were written in the Metric system without Imperial equivalents being included. It should be noted that this is the first instance that all doses and formulas in the Imperial system were omitted from the hospital pharmacopoeia. The pharmacy staff will still support the advent of prescription writing. Though in itself the metric is no better than the English standard, the system based on it is much more convenient than the British system in that the multiples and submultiples being in the decimal system, much time is saved in reduction and conversion are expressed as the decimal of one, thousandths and not in seven. Again the measures of length and volume are simply related to those of length and the gram is an ephemer as to its relative weight of that of water at the point of maximum density. The pharmacist prefers the Metric system for its simplicity in calculations with the decimal point delimiting the fraction. Percentage solutions are naturally discussed because of the direct relationship of the gram and the millilitre and no more does this appear to become confused over the gram and the millilitre.

The British Pharmacopoeia 1958 forces the dispensing chemist to use metric measurements of kg or kg weights, accurately the 120 drugs for which metric doses only are given. Note that we are using milligrams and grams in measurements of weight and millilitres as a measure of volume are

¹This is printed in the *Editorial* in *The Australian Journal of Pharmacy*, and the article by C. E. MacCormick for points to against the change to the Metric system published in the October 1958 issue of *The Australian Journal of Pharmacy*.

it will be no disposal of grams, milligrams and pounds as well as meters and millimeters measure thereby making the dispensing of new systems of weights and measures unnecessary.

It was realized that with the introduction of the Metric system in the early in the hospital (in the 1950) by the nursing staff of nurses and fluid culture containers as well as the domestic household measures of teaspoonful and tablespoonful would cease. The use of mililitres as a volume measurement would mean that the nursing staff would have only one system to contend with. It would be of great advantage to the nurse for all fluid intake and fluid output measurements would be in the same system as the individual dose for the patient. The result of this will mean that the trained nurse will only be required to learn one system of fluid measurement. Difficulty would then have experienced in using the mililitre as a dosage measurement for substances which were stated to retain the domestic measures of teaspoonful and tablespoonful for the benefit of the patient.

Another reason that prompted the adoption of the Metric system was that the hospital has a responsibility as a teaching institution to instruct the students in the Metric system. It was confidently expected that as the medical doctors were trained in the metric that they would become doctors who would universally use the Metric system in their prescription writing hospitals had shown that pharmacists were not familiar with the Metric system and that most of them used the laborious method of converting metric doses to imperial doses before dispensing the prescription. It was likewise confidently anticipated that pharmacists after a period at the hospital would consider it an advantage to use Metric weights and measures.

Further support to the adoption of the Metric system was given by medical literature and drug manufacturers. All new products being used have dosage expressed in the Metric system so that the relationship between drugs of similar therapeutic action is readily seen. No longer will we have drugs with similar therapeutic actions expressed in different systems so that the relation of their doses cannot readily be seen. Powdered digitalis leaf has a maintenance dose of 1 to 10 grains (not 30 to 90 mg). But Digitalis has a maintenance dose of 0.15 mg (not 1/20 grain) once or twice daily. It was however the duty of all pharmacists to introduce the system and to end the confusion of the Imperial, Apothecaries and Apothecaries systems. When the dispensing chemist adopts the Metric system entirely it will no longer be necessary to state on the label that the strength of the morphine sulphate injection is 1 grain in 1 ml. How much more correct will it be to state that the strength is 15 mg in 1 ml.

PREPARATORY ORGANIZATION

A conference of medical staff personnel presided over by the Medical Superintendent the problems which would be created by the introduction of the Metric system were discussed. It was soon evident that the greatest concern was that of patient resistance which might develop as difficulties were

announced. It was decided to issue a Metric Conversion Leaflet to all staff in Boxes, familiar with the operations. This was circulated in the Hospital Headquarters. Positive action was taken by suggesting to the staff conference that everybody should be encouraged to heat in the Metric system for as this was done at the necessary to convert from Metric to the Imperial system would prove.

The following decisions were endorsed:

- (1) All fluid intake and output would be measured and recorded in the Metric system.
- (2) All body temperatures were to be taken and recorded in degrees Centigrade.
- (3) The height of patients was to be measured and recorded in centimetres.
- (4) Body weight was to be recorded in kilograms.
- (5) A Metric Conversion Table of approximate equivalents was to be prepared. This table would provide a standard for use by the nursing staff and would show the equivalent Fahrenheit for a recorded Centigrade temperature, the equivalent of inches and pounds to a recorded kilograms body weight and the equivalent in feet and inches of a height recorded in centimetres.
- (6) The Physician was instructed to change all word index charts, Imperial measurements to metric measurements.

Grams to milligram (mg.)
Ounces to Gram (G.)
Millilitres to millilitre (ml.)
Fluid ounces to millilitres (ml.)
One teaspoonful to 5 millilitres (5 ml.)
Two teaspoonfuls to 10 millilitres (10 ml.)
One tablespoonful to 15 millilitres (15 ml.)

- (7) The medical staff were to be instructed to use the Metric system.
- (8) The co-operation of the hospital medical staff was to be sought and steps were to be taken to change their prescribing to the Metric system.
- (9) The date for the change over would be midday of 30th April so that all hospital records from the 1st May 1959 would be in Metric system.

THE PREPARATION

- (1) *Fluid Scale*—Clear plastic peg shaped with a pointed tip and graduated in millilitres were provided.
- (2) *Fluid Output*—Opaque plastic pegs graduated in millilitres and of a different shape to those used for fluid intake were provided.
- (3) *Skin*—Small pegs that were in use and graduated in fluid ounces and pints and cubic centimetres were remade in millilitres and litres.
- (4) All the equipment was delivered prior to 30th April and on 1st May all Imperial measures were withdrawn.
- (5) Centigrade thermometers were recalibrated and Fahrenheit thermometers were withdrawn.
- (6) The height register ordered in the Imperial system was renamed but

a basic rod graduated in millimetres was affixed to the patient's mattress group.

(1) It was not possible, except at great cost, to convert the present patient weighing scales to the Metric system so the nursing staff were instructed to weigh on the present scale, convert the centidekton weight to the Metric equivalent and record the weight in the Metric system.

(2) Tables showing approximate equivalents were pasted on both the front and reverse sides of a folded card. The various tables showed:

- (a) The equivalent Fahrenheit temperatures to Centigrade. The range of temperatures were from 35.0 °C to 40.0 °C.
- (b) The equivalent kilogram weights for stones and pounds. The range of weights commenced at 1.1 Pwt (5 g) and went through to 38.8 kg (85.4 lb.). Any weight greater than this could be calculated from the table.
- (c) A measurement of length commencing at 9.1 mm (3/8 in.) and ranged to 102.9 cm (40 ft.).
- (d) Approximate equivalents of fluid measures and volumes also measures and weights.
- (e) Approximate equivalents of milligrams (micrograms) to grams/milligrams.
- (f) A Table of Metric Weights and Volumes.
- (g) Approximate equivalents for dosing purposes related to the domestic measures of teaspoonful and tablespoonful.
- (h) A percentage dilution table.

A copy of the tables is given at the end of this article.

Reactions of Pharmacy Staff.

It may be of interest to hospital pharmacists to learn of the method by which pharmacy stock labelled in the Imperial system was changed overnight to the Metric system. Much preliminary consultation had been done prior to the change over on 1st May. Labels with doses of ingredients in the Imperial system were withdrawn and new labels showing all doses of ingredients in Metric units obtained. As new stock for wards and departments was packed the Metric labels were attached. For a short period prior to 1st May 1960, it was necessary to use the domestic measure of one teaspoonful or one tablespoonful on the label and the metric dose of 4 ml or 10 ml was blotted out.

On the evening of 20th April, commencing at 7 p.m., qualified pharmacists assisted by apprentices, under the direction of the Chief Pharmacist, visited the departments and wards throughout the hospital. The drug tinsboards in each department and ward were inspected and any drugs labelled in the Imperial system had the labels changed to the Metric system. Uniformity in converted doses was assured by the use of the R.M.H. Metric Conversion Table Approximate Equivalents. The task was completed by 9.30 p.m. The hospital was thus assured of correct metric equivalents in storage of stock, no

introduction in the drug treatment of patients and no indoctrination to dispensing staff.

The ease of implementation of the Metric system cannot all be attributed to the medical and nursing staff co-operated with the pharmacy staff and the change over was effected without disturbance or confusion. In the change over period from the Imperial to the Metric system compromises were permitted but the period must be limited. All the Imperial system methods and measures must be abolished. The pharmacist must no longer dispense by prescriptions by converting the Metric measurements to Imperial equivalents and he will dispose of his Imperial weights and measures. The Royal Melbourne Hospital Metric Conversion Table of Approximate Equivalents will not be reprinted as it was intended only as a means of helping the staff to relate the Imperial and Metric systems of measurement.

The Metric system has now been in operation for five months and is regarded as the second best selling system. It is hoped that the Metric system will be adopted by other hospitals, doctors and pharmacists generally. It is confidently anticipated that doctors, nurses and pharmacists trained at the Royal Melbourne Hospital will go out into the world and change all pertaining to the Metric system. All our efforts will be in vain if the Metric system remains unused by the general practitioner and the family chemist. We look hopefully for an universal adoption so that midwives and pharmacists will be able to reduce the evil disadvantages of this system.

We at the Royal Melbourne Hospital have welcomed the adoption of the Metric system and now that we have learnt to think in this system we are looking to your advocation over the continued Imperial system.

Our appeal now is to the dispensing chemist to follow the lead given by the hospital and in every way endeavour to minimise the use of the Metric system in dispensing.

Form of Coal—Cabinet 1

THE ROYAL MELBOURNE HOSPITAL
METRIC CONVERSION TABLET
(APPROXIMATE EQUIVALENTS—Ounces)

Cabinet 2

TABLE OF INFORMATION—Ounces

TABLE OF METRIC WEIGHTS AND VOLUMES

1000 milligrams = 1 milligram (mg.)

1000 grams = 1 Gram (G.)

1000 ml. = 1 Litre (L.)

1 cubic centimetre (cc) is equal to 1 millilitre (ml.)

1000 millilitres = 1 litre (l.)

APPROXIMATE EQUIVALENTS FOR ONE DISPENSING UNIT		METRIC EQUIVALENTS	
One teaspoonful	4 ml.	12 ml.	1 ml. diluted in 1000 ml. (1 in 1000)
Two teaspoonfuls	8 ml.	24 ml.	2 ml. diluted in 1000 ml. (1 in 500)
One tablespoonful	12 ml.	36 ml.	3 ml. diluted in 1000 ml. (1 in 333)
Two tablespoonfuls	20 ml.	60 ml.	6 ml. diluted in 1000 ml. (1 in 166)
			10 ml.
			15 ml.
			20 ml.

¹ The adoption of the New Towns / *in Paul Mirell et al., *New Towns**

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Chapter 4: Migration

REFERENCES

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卷之三

Frost-free	6°C	32
Cold	7°C	33
Cool	10°C	35
Moderate	15°C	39
Temperate	20°C	43
Subtropical	25°C	47
Tropical	30°C	51
Hot	35°C	55
Hot under Forest top	38°C	58
Hot desert	40°C	60

3. The adoption of the Union subjects by the Royal Household Abigail
Collins (see *ibid.*, p. 100).

СОВЕТСКАЯ ОКУПАЦИЯ ВЪЮГѢ СОВѢТСКОЙ РЕПУБЛИКИ

--

100 years old in 1999

100

卷之三

REFERENCES

Column 5—(Back of Card)

CONVERSIONS OF FEET AND INCHES TO CENTIMETERS

0 ft.	0 in.	00.0 cm	0 ft.	0 in.	00.0 cm
0 ft.	1 in.	2.5 cm	0 ft.	2 in.	5.0 cm
0 ft.	2 in.	5.0 cm	0 ft.	3 in.	7.5 cm
0 ft.	3 in.	7.5 cm	0 ft.	4 in.	10.0 cm
0 ft.	4 in.	10.0 cm	0 ft.	5 in.	12.5 cm
0 ft.	5 in.	12.5 cm	0 ft.	6 in.	15.0 cm
0 ft.	6 in.	15.0 cm	0 ft.	7 in.	17.5 cm
0 ft.	7 in.	17.5 cm	0 ft.	8 in.	20.0 cm
0 ft.	8 in.	20.0 cm	0 ft.	9 in.	22.5 cm
0 ft.	9 in.	22.5 cm	0 ft.	10 in.	25.0 cm
0 ft.	10 in.	25.0 cm	0 ft.	11 in.	27.5 cm
0 ft.	11 in.	30.0 cm	0 ft.	12 in.	32.5 cm
0 ft.	12 in.	35.0 cm	0 ft.	13 in.	37.5 cm
0 ft.	13 in.	40.0 cm	0 ft.	14 in.	42.5 cm
0 ft.	14 in.	45.0 cm	0 ft.	15 in.	47.5 cm
0 ft.	15 in.	50.0 cm	0 ft.	16 in.	52.5 cm
0 ft.	16 in.	55.0 cm	0 ft.	17 in.	57.5 cm
0 ft.	17 in.	60.0 cm	0 ft.	18 in.	62.5 cm
0 ft.	18 in.	65.0 cm	0 ft.	19 in.	67.5 cm
0 ft.	19 in.	70.0 cm	0 ft.	20 in.	72.5 cm
0 ft.	20 in.	75.0 cm	0 ft.	21 in.	77.5 cm
0 ft.	21 in.	80.0 cm	0 ft.	22 in.	82.5 cm
0 ft.	22 in.	85.0 cm	0 ft.	23 in.	87.5 cm
0 ft.	23 in.	90.0 cm	0 ft.	24 in.	92.5 cm
0 ft.	24 in.	95.0 cm	0 ft.	25 in.	97.5 cm
0 ft.	25 in.	100.0 cm	0 ft.	26 in.	102.5 cm
0 ft.	26 in.	105.0 cm	0 ft.	27 in.	107.5 cm
0 ft.	27 in.	110.0 cm	0 ft.	28 in.	112.5 cm
0 ft.	28 in.	115.0 cm	0 ft.	29 in.	117.5 cm
0 ft.	29 in.	120.0 cm	0 ft.	30 in.	122.5 cm
0 ft.	30 in.	125.0 cm	0 ft.	31 in.	127.5 cm
0 ft.	31 in.	130.0 cm	0 ft.	32 in.	132.5 cm
0 ft.	32 in.	135.0 cm	0 ft.	33 in.	137.5 cm
0 ft.	33 in.	140.0 cm	0 ft.	34 in.	142.5 cm
0 ft.	34 in.	145.0 cm	0 ft.	35 in.	147.5 cm
0 ft.	35 in.	150.0 cm	0 ft.	36 in.	152.5 cm
0 ft.	36 in.	155.0 cm	0 ft.	37 in.	157.5 cm
0 ft.	37 in.	160.0 cm	0 ft.	38 in.	162.5 cm
0 ft.	38 in.	165.0 cm	0 ft.	39 in.	167.5 cm
0 ft.	39 in.	170.0 cm	0 ft.	40 in.	172.5 cm
0 ft.	40 in.	175.0 cm	0 ft.	41 in.	177.5 cm
0 ft.	41 in.	180.0 cm	0 ft.	42 in.	182.5 cm
0 ft.	42 in.	185.0 cm	0 ft.	43 in.	187.5 cm
0 ft.	43 in.	190.0 cm	0 ft.	44 in.	192.5 cm
0 ft.	44 in.	195.0 cm	0 ft.	45 in.	197.5 cm
0 ft.	45 in.	200.0 cm	0 ft.	46 in.	202.5 cm
0 ft.	46 in.	205.0 cm	0 ft.	47 in.	207.5 cm
0 ft.	47 in.	210.0 cm	0 ft.	48 in.	212.5 cm
0 ft.	48 in.	215.0 cm	0 ft.	49 in.	217.5 cm
0 ft.	49 in.	220.0 cm	0 ft.	50 in.	222.5 cm
0 ft.	50 in.	225.0 cm	0 ft.	51 in.	227.5 cm
0 ft.	51 in.	230.0 cm	0 ft.	52 in.	232.5 cm
0 ft.	52 in.	235.0 cm	0 ft.	53 in.	237.5 cm
0 ft.	53 in.	240.0 cm	0 ft.	54 in.	242.5 cm
0 ft.	54 in.	245.0 cm	0 ft.	55 in.	247.5 cm
0 ft.	55 in.	250.0 cm	0 ft.	56 in.	252.5 cm
0 ft.	56 in.	255.0 cm	0 ft.	57 in.	257.5 cm
0 ft.	57 in.	260.0 cm	0 ft.	58 in.	262.5 cm
0 ft.	58 in.	265.0 cm	0 ft.	59 in.	267.5 cm
0 ft.	59 in.	270.0 cm	0 ft.	60 in.	272.5 cm
0 ft.	60 in.	275.0 cm	0 ft.	61 in.	277.5 cm
0 ft.	61 in.	280.0 cm	0 ft.	62 in.	282.5 cm
0 ft.	62 in.	285.0 cm	0 ft.	63 in.	287.5 cm
0 ft.	63 in.	290.0 cm	0 ft.	64 in.	292.5 cm
0 ft.	64 in.	295.0 cm	0 ft.	65 in.	297.5 cm
0 ft.	65 in.	300.0 cm	0 ft.	66 in.	302.5 cm
0 ft.	66 in.	305.0 cm	0 ft.	67 in.	307.5 cm
0 ft.	67 in.	310.0 cm	0 ft.	68 in.	312.5 cm
0 ft.	68 in.	315.0 cm	0 ft.	69 in.	317.5 cm
0 ft.	69 in.	320.0 cm	0 ft.	70 in.	322.5 cm
0 ft.	70 in.	325.0 cm	0 ft.	71 in.	327.5 cm
0 ft.	71 in.	330.0 cm	0 ft.	72 in.	332.5 cm
0 ft.	72 in.	335.0 cm	0 ft.	73 in.	337.5 cm
0 ft.	73 in.	340.0 cm	0 ft.	74 in.	342.5 cm
0 ft.	74 in.	345.0 cm	0 ft.	75 in.	347.5 cm
0 ft.	75 in.	350.0 cm	0 ft.	76 in.	352.5 cm
0 ft.	76 in.	355.0 cm	0 ft.	77 in.	357.5 cm
0 ft.	77 in.	360.0 cm	0 ft.	78 in.	362.5 cm
0 ft.	78 in.	365.0 cm	0 ft.	79 in.	367.5 cm
0 ft.	79 in.	370.0 cm	0 ft.	80 in.	372.5 cm
0 ft.	80 in.	375.0 cm	0 ft.	81 in.	377.5 cm
0 ft.	81 in.	380.0 cm	0 ft.	82 in.	382.5 cm
0 ft.	82 in.	385.0 cm	0 ft.	83 in.	387.5 cm
0 ft.	83 in.	390.0 cm	0 ft.	84 in.	392.5 cm
0 ft.	84 in.	395.0 cm	0 ft.	85 in.	397.5 cm
0 ft.	85 in.	400.0 cm	0 ft.	86 in.	402.5 cm
0 ft.	86 in.	405.0 cm	0 ft.	87 in.	407.5 cm
0 ft.	88 in.	410.0 cm	0 ft.	89 in.	412.5 cm
0 ft.	90 in.	415.0 cm	0 ft.	91 in.	417.5 cm
0 ft.	92 in.	420.0 cm	0 ft.	93 in.	422.5 cm
0 ft.	94 in.	425.0 cm	0 ft.	95 in.	427.5 cm
0 ft.	96 in.	430.0 cm	0 ft.	97 in.	432.5 cm
0 ft.	98 in.	435.0 cm	0 ft.	99 in.	437.5 cm
0 ft.	100 in.	440.0 cm	0 ft.	101 in.	442.5 cm
0 ft.	102 in.	445.0 cm	0 ft.	103 in.	447.5 cm
0 ft.	104 in.	450.0 cm	0 ft.	105 in.	452.5 cm
0 ft.	106 in.	455.0 cm	0 ft.	107 in.	457.5 cm
0 ft.	108 in.	460.0 cm	0 ft.	109 in.	462.5 cm
0 ft.	110 in.	465.0 cm	0 ft.	111 in.	467.5 cm
0 ft.	112 in.	470.0 cm	0 ft.	113 in.	472.5 cm
0 ft.	114 in.	475.0 cm	0 ft.	115 in.	477.5 cm
0 ft.	116 in.	480.0 cm	0 ft.	117 in.	482.5 cm
0 ft.	118 in.	485.0 cm	0 ft.	119 in.	487.5 cm
0 ft.	120 in.	490.0 cm	0 ft.	121 in.	492.5 cm
0 ft.	122 in.	495.0 cm	0 ft.	123 in.	497.5 cm
0 ft.	124 in.	500.0 cm	0 ft.	125 in.	502.5 cm
0 ft.	126 in.	505.0 cm	0 ft.	127 in.	507.5 cm
0 ft.	128 in.	510.0 cm	0 ft.	129 in.	512.5 cm
0 ft.	130 in.	515.0 cm	0 ft.	131 in.	517.5 cm
0 ft.	132 in.	520.0 cm	0 ft.	133 in.	522.5 cm
0 ft.	134 in.	525.0 cm	0 ft.	135 in.	527.5 cm
0 ft.	136 in.	530.0 cm	0 ft.	137 in.	532.5 cm
0 ft.	138 in.	535.0 cm	0 ft.	139 in.	537.5 cm
0 ft.	140 in.	540.0 cm	0 ft.	141 in.	542.5 cm
0 ft.	142 in.	545.0 cm	0 ft.	143 in.	547.5 cm
0 ft.	144 in.	550.0 cm	0 ft.	145 in.	552.5 cm
0 ft.	146 in.	555.0 cm	0 ft.	147 in.	557.5 cm
0 ft.	148 in.	560.0 cm	0 ft.	149 in.	562.5 cm
0 ft.	150 in.	565.0 cm	0 ft.	151 in.	567.5 cm
0 ft.	152 in.	570.0 cm	0 ft.	153 in.	572.5 cm
0 ft.	154 in.	575.0 cm	0 ft.	155 in.	577.5 cm
0 ft.	156 in.	580.0 cm	0 ft.	157 in.	582.5 cm
0 ft.	158 in.	585.0 cm	0 ft.	159 in.	587.5 cm
0 ft.	160 in.	590.0 cm	0 ft.	161 in.	592.5 cm
0 ft.	162 in.	595.0 cm	0 ft.	163 in.	597.5 cm
0 ft.	164 in.	600.0 cm	0 ft.	165 in.	602.5 cm
0 ft.	166 in.	605.0 cm	0 ft.	167 in.	607.5 cm
0 ft.	168 in.	610.0 cm	0 ft.	169 in.	612.5 cm
0 ft.	170 in.	615.0 cm	0 ft.	171 in.	617.5 cm
0 ft.	172 in.	620.0 cm	0 ft.	173 in.	622.5 cm
0 ft.	174 in.	625.0 cm	0 ft.	175 in.	627.5 cm
0 ft.	176 in.	630.0 cm	0 ft.	177 in.	632.5 cm
0 ft.	178 in.	635.0 cm	0 ft.	179 in.	637.5 cm
0 ft.	180 in.	640.0 cm	0 ft.	181 in.	642.5 cm
0 ft.	182 in.	645.0 cm	0 ft.	183 in.	647.5 cm
0 ft.	184 in.	650.0 cm	0 ft.	185 in.	652.5 cm
0 ft.	186 in.	655.0 cm	0 ft.	187 in.	657.5 cm
0 ft.	188 in.	660.0 cm	0 ft.	189 in.	662.5 cm
0 ft.	190 in.	665.0 cm	0 ft.	191 in.	667.5 cm
0 ft.	192 in.	670.0 cm	0 ft.	193 in.	672.5 cm
0 ft.	194 in.	675.0 cm	0 ft.	195 in.	677.5 cm
0 ft.	196 in.	680.0 cm	0 ft.	197 in.	682.5 cm
0 ft.	198 in.	685.0 cm	0 ft.	199 in.	687.5 cm
0 ft.	200 in.	690.0 cm	0 ft.	201 in.	692.5 cm
0 ft.	202 in.	695.0 cm	0 ft.	203 in.	697.5 cm
0 ft.	204 in.	700.0 cm	0 ft.	205 in.	702.5 cm
0 ft.	206 in.	705.0 cm	0 ft.	207 in.	707.5 cm
0 ft.	208 in.	710.0 cm	0 ft.	209 in.	712.5 cm
0 ft.	210 in.	715.0 cm	0 ft.	211 in.	717.5 cm
0 ft.	212 in.	720.0 cm	0 ft.	213 in.	722.5 cm
0 ft.	214 in.	725.0 cm	0 ft.	215 in.	727.5 cm
0 ft.	216 in.	730.0 cm	0 ft.	217 in.	732.5 cm
0 ft.	218 in.	735.0 cm	0 ft.	219 in.	737.5 cm
0 ft.	220 in.	740.0 cm	0 ft.	221 in.	742.5 cm
0 ft.	222 in.	745.0 cm	0 ft.	223 in.	747.5 cm
0 ft.	224 in.	750.0 cm	0 ft.	225 in.	752.5 cm
0 ft.	226 in.	755.0 cm	0 ft.	227 in.	757.5 cm
0 ft.	228 in.	760.0 cm	0 ft.	229 in.	762.5 cm
0 ft.	230 in.	765.0 cm	0 ft.	231 in.	767.5 cm
0 ft.	232 in.	770.0 cm	0 ft.	233 in.	772.5 cm
0 ft.	234 in.	775.0 cm	0 ft.	235 in.	777.5 cm
0 ft.	236 in.	780.0 cm	0 ft.	237 in.	782.5 cm
0 ft.	238 in.	785.0 cm	0 ft.	239 in.	787.5 cm
0 ft.	240 in.	790.0 cm	0 ft.	241 in.	792.5 cm
0 ft.	242 in.	795.0 cm	0 ft.	243 in.	797.5 cm
0 ft.	244 in.	800.0 cm	0 ft.	245 in.	802.5 cm
0 ft.	246 in.	805.0 cm	0 ft.	247 in.	807.5 cm
0 ft.	248 in.	810.0 cm	0 ft.	249 in.	812.5 cm
0 ft.	250 in.	815.0 cm	0 ft.	251 in.	817.5 cm
0 ft.	252 in.	820.0 cm	0 ft.	253 in.	822.5 cm
0 ft.	254 in.	825.0 cm	0 ft.	255 in.	827.5 cm
0 ft.	256 in.	830.0 cm	0 ft.	257 in.	832.5 cm
0 ft.	258 in.	835.0 cm	0 ft.	259 in.	837.5 cm
0 ft.	260 in.	840.0 cm	0 ft.	261 in.	842.5 cm
0 ft.	262 in.	845.0 cm	0 ft.	263 in.	847.5 cm
0 ft.	264 in.	850.0 cm	0 ft.	265 in.	852.5 cm
0 ft.	266 in.	855.0 cm	0 ft.	267 in.	857.5 cm
0 ft.	268 in.	860.0 cm	0 ft.	269 in.	862.5 cm
0 ft.	270 in.	865.0 cm	0 ft.	271 in.	867.5 cm
0 ft.	272 in.	870.0 cm	0 ft.	273 in.	872.5 cm
0 ft.	274 in.	875.0 cm	0 ft.	275 in.	877.5 cm
0 ft.	276 in.	880.0 cm	0 ft.	277 in.	882.5 cm
0 ft.	278 in.	885.0 cm	0 ft.	279 in.	887.5 cm
0 ft.	280 in.	890.0 cm	0 ft.	281 in.	892.5 cm
0 ft.	282 in.	895.0 cm	0 ft.	283 in.	897.5 cm
0 ft.	284 in.	900.0 cm	0 ft.	285 in.	902.5 cm
0 ft.	286 in.	905.0 cm	0 ft.	287 in.	907.5 cm
0 ft.	288 in.	910.0 cm	0 ft.	289 in.	912.5 cm
0 ft.	290 in.	915.0 cm	0 ft.	291 in.	917.5 cm
0 ft.	292 in.	920.0 cm	0 ft.	293 in.	922.5 cm
0 ft.	294 in.	925.0 cm	0 ft.	295 in.	927.5 cm
0 ft.	296 in.	930.0 cm	0 ft.	297 in.	932.5 cm
0 ft.	298 in.	935.0 cm	0 ft.	299 in.	937.5 cm
0 ft.	300 in.	940.0 cm	0 ft.	301 in.	942.5 cm
0 ft.	302 in.	945.0 cm	0 ft.	303 in.	947.5 cm
0 ft.	304 in.	950.0 cm	0 ft.	305 in.	952.5 cm
0 ft.	306 in.	955.0 cm	0 ft.	307 in.	957.5 cm
0 ft.	308 in.	960.0 cm	0 ft.	309 in.	962.5 cm
0 ft.	310 in.	965.0 cm	0 ft.	311 in.	967.5 cm
0 ft.	312 in.	970.0 cm	0 ft.	313 in.	972.5 cm
0 ft.	314 in.	975.0 cm	0 ft.	315 in.	977.5 cm
0 ft.	316 in.	980.0 cm	0 ft.	317 in.	982.5 cm
0 ft.	318 in.	985.0 cm	0 ft.	319 in.	987.5 cm
0 ft.	320 in.	990.0 cm	0 ft.	321 in.	992.5 cm
0 ft.	322 in.	995.0 cm	0 ft.	323 in.	997.5 cm
0 ft.	324 in.	1000.0 cm	0 ft.	325 in.	1002.5 cm

0 each equals 1.3 centimeters

Rounded to one decimal

Size of card 24 centimeters—14 centimeters, which is folded on 1 so that each field measures 8 centimeters—14 centimeters

[We are indebted to Mr. Macpherson for the foregoing article, which is also the subject of a great editorial by Dr. P. N. O'Donnell, of the Royal Melbourne Hospital. Comments are invited.—Editor, *The Australian Journal of Pharmacy*, October 10, 1938.]

THE CORNELL MEDICAL INDEX

II

Lieutenant Commander W. CULLEN, R.N.

During the war in the Royal Navy, much time and expense are spent in the service of men who for one reason or another quickly become lame and require to be discharged from the Service as unserviceable before they have been able to make a contribution sufficient to justify, from an economic point of view, the liabilities the Service has incurred on their behalf.

The scope of this problem can be gauged from the following figures:

TABLE I.

Date	Strength of R.N.	Number of men discharged		Percentage discharged
		in miles	as unfit	
1914	120,000	1,472	1,472	1.22
1915	125,000	9,000	9,000	7.14
1916	115,000	11,083	11,083	9.57
1917	100,000	11,239	11,239	11.24
1918	100,000	279	279	0.28

These figures for discharges expressed as a yearly basis as a percentage of the total force are probably not disturbing. But however when it is taken on the basis of five years and it is seen that a total of 7,172 men have been discharged from a force which has averaged 111,500 men total strength over that period, it is clear that there is a significant problem and that a substantial savings of public money and time is occurring. Anything that can be regarded to ease this problem is obviously worth consideration.

It is suggested that something more than the present system of medical examinations on entry should be advantageous. This examination does weet out those with obvious or gross physical defects or bodily illness which can be detected quickly on routine medical examination. It largely ignores, however, questions of psychiatry, disease and in most instances no evaluation of a man's fitness to serve significant factors in the overall fitness judgment and psychiatric fitness. I do not intend to suggest that either the "entry medical officer" are inefficient or the new recruits particularly deficient, but the whole emphasis at the time of the medical examination is on evaluation for the Service and it may be that in the atmosphere of recruit preparation fitness is the recruit's constitutional make up or medical history do not receive the attention which they deserve. To overcome this apparent defect in the present entry system some method of screening is called for in which

thus unavoidable time may be quickly gained by using a method involving either all patients or a subset having symptoms which most have never possessed or the medical staff in what will generally be a time-wasting and frustrating procedure.

Such a method of screening is available in the Cornell Medical Index Health Questionnaire.

The questionnaire is a series of 105 questions couched in simple and straightforward English with a minimum of technical terms and requiring a simple "Yes" or "No" answer given by circling the appropriate response. The questions are grouped by "body systems" and quickly direct attention to any disease which the subject may have suffered from in the past or is suffering from at the moment. The answers to the questions when scored in full will also draw attention to the individual's resilience to disease and stress and give a significant indication of the subject's emotional stability and maturity.

The system of eliciting the past medical history of the subject is non-invasive and representative of manpower. It requires no skilled administrator; it can be quickly completed by a group in one time and it requires no skilled interpretation. The answer is quickly and easily given and the Medical Officer is then able to concentrate to once on any subject point disclosed.

This point is fully made in an article in the *AMJ* in 1952 [1]. It is stated there that the average person takes fifteen or so minutes to complete the form and the doctor one of two minutes to know the contents before he says and examines the patient. The points are also made that it often disclosed evidence of disease which was later corroborated in both an and outpatient setting both and that physicians by its use can not only forecast precisely all the diagnostic categories in which disease will later be discovered but they can usually name the actual diseases which are present.

From a psychiatric point of view the questionnaire is also most valuable. It has been statistically determined that there is presumptive evidence of serious if the patient makes "Yes" more than responses of he answers three or more questions "Yes" and "No" if he gives the answer to six or more questions, and if he adds three or more remarks or makes three or more changes to the questions.

In its relationship to Service medicine Tables II and III quoted by Bodman, Erdmann and Wyll Cornell University 1955 would appear to give ample evidence of its value.

Table II [2]—The Relation of the No. of "Yes" Responses on the Cornell Index to Convalescent Performance During Army Training

	100 men with 40 men with poor adaptability	100 men with good adaptability
Mean No. of "yes" cells	1.7	1.6
Mean No. of days hospitalized	1.2	1.0
Mean No. of days AWOL	0.3	0.4
Percent of non-compliant by disease method	1.6	0.1
Percent of men discharged	1.2	0.0

TABLE II.—THE NUMBER OF SUBJECTS WITH MEDICAL INDEXES OF 20% OR MORE IN THE CORNELL MEDICAL INDEX AND IN THE 2000-PERSON INDEX.

Number of subjects	2000-patient		201-patient	
	Percent	Number	Percent	Number
2 or more	71	142	72	14
5 or more	41	82	43	8
10 or more	33	66	33	6
20 or more	14	28	15	3
30 or more	7	14	7	1
40 or more	3	6	3	0
50 or more	1	2	1	0
60 or more	1	2	1	0
70 or more	1	2	1	0

The table shows the example, at the 20 per cent level of 20, 17 per cent of the questionnaires require and 17 per cent of the questionnaires require give 20 per cent. Ten instances.

DISCUSSION

The need for a method which will quickly determine the subject's past medical history, present state and his attitude to illness and stress is well known to all Medical Officers and any system which will enable these to be assessed readily is worthy of consideration. The Cornell Medical Index provides such a method and while no one would claim that it is an infallible guide to either organic or psychiatric illness it does readily present the possibility of such disease existing and allows specific investigation and treatment to be directed readily to the appropriate point.

The questionnaire method of eliciting information has, of course, certain defects and to some extent relies on the honesty of the subject in making his responses. However these defects should not be of great moment in a setting such as the one suggested here, and there in the examining officer their responses which deviate from the accepted norms would be checked and investigated in any case.

It is considered that the Cornell Medical Index would be of particular advantage in assessing the fitness of the potential recruit for service and that it would not involve either any delay in the examination of the man or cost for the examination of anything more than a very minor amount of public money and time—an expenditure which would be well worth while having regard to the savings which might be expected by eliminating potentially unfit men prior to entry.

SUMMARY

A short version of the Cornell Medical Index Health Questionnaire and its possible value in the quick assessment of potential recruits for the Service.

REFERENCES

- [1] The Prisoner of War, 1952, R.M.J., 8, 476 (24).
- [2] Brown K., Dawson A. J. and Streat M. D. (1952) Cornell Medical Index: Medical Questionnaire. Cornell University, N.Y. 11, N.Y.

ANESTHETICS AFLOAT

PT

Sergeant Commander W. V. DAVIDSON, R.N.

When, at sea, it is decided that a surgical operation must be performed in order to save life or to avoid disability then the choice of anaesthesia must be considered. This choice will depend on various factors such as:

- (a) The anaesthetic experience of the medical officer
- (b) The anaesthetic apparatus available
- (c) The anaesthetic drugs available
- (d) Whether the medical officer is alone and therefore responsible for both giving the anaesthesia and performing the operation

The Anaesthetic Experience of the Medical Officer

Medical Officers, serving at sea, experienced in giving anaesthesia will be guided by their own experience. This chapter is written for those medical officers who have had little anaesthetic experience, to serve as a guide in what is best, a worrying, and at worst, a potentially dangerous, situation.

The Anaesthetic Apparatus Available

This may vary from a mask for open methods to a standard Boyle's apparatus with laryngostyle and endotracheal tubes. Whatever equipment is supplied it is most important to examine it at frequent intervals to ensure that it is in an satisfactory condition. It is not safe to find faulty apparatus just before an emergency operation. Whatever apparatus is supplied for general anaesthesia the following should also be available:

esopharyngeal airways, tongue forceps, mouth gag, sponge holding forceps, sprigges of salines, two (1 ml. to 20 ml.) for local anaesthesia and five 1% anaesthetics.

In addition a nasopharyngeal airway can be of great value in difficult cases of airway obstruction. A cut down endotracheal tube makes a good nasopharyngeal airway—the length should be equal to the distance between the tip of the nose and the lobe of the ear. A safety pin should be put through the end of the tube to prevent it from slipping down the nose.

The Anaesthetic Drugs Available

These will vary with the anaesthetic apparatus supplied. There should be sufficient drugs for the type of cases being contemplated. For example, if only an open mask is supplied then the necessary drugs will be atropine for premedication, thiopentone, ether and possibly chloroform. On the other hand, if a field or standard Boyle's apparatus is supplied then there should be an addition to the above supplies of nitrous oxide and oxygen cylinders.

insects, nematodes and neopeltidines (nematodes) and *C. cinctivittatus* which is an ectoparasitic mite found on several species of beetles.

Journal of Black Research for Health Justice and Equity

Where people located the medical officer should always carry out the induction of anaesthesia and when the desired plane of anaesthesia is established hand over to a sole birth attendant or to another officer. From this can be seen ensured the maintenance of anaesthesia by verbal intubation.

Local anaesthesia should always be considered by the unprepared anaesthetist and only after no evidence should a general anaesthetic be undertaken. Most surgical operations can be performed under local anaesthesia but some techniques require a considerable degree of skill and experience. Before attempting an operation under local anaesthesia, always give pre-anaesthesia of atropine 0.5 mg and 10 mg griseofulvin to the operator. The bed and walls, local anaesthesia, as present in use to lignocaine hydrochloride cyclohexylamine. This drug can be used in strengths of 0.5 per cent. for infiltration 1 per cent. for nerve block and 4 per cent. for topical anaesthesia. Its action is rapid and brief, for two to three hours. Adrenalin 1 : 250 000 may be added but is not essential unless a very long operation or long anaesthesia. Adrenalin must never be used in the region of oral nerves e.g. trigeminal and maxillary.

Geological Structure of Pakistan

四、結論與建議

第二章 基本概念

For example, the *liver* is a major site of metabolism, and the *liver* is a major site of metabolism.

Polymer Letters Edition

(1) **Resuscitation**—By law it is mandatory to get consent to perform an operation and to administer a general anaesthetic. In the Services there permission can be given by all personnel who have reached the age of 18 years—age 21. For those under 18 years of age the Captain or emergency medical officer can consent in lieu of a parent or guardian.

The estimated weight for each leg, and the equation must be weighted similarly from 0 to 100 as follows:

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which you prefer the opinion of experts of
other and nature of which have been explained to me and in the interests
of a general as well as particular for this purpose.

I also suggest to each Rector or other senior executive nominate an executive who may be necessary during the period of trial, and directly accountable to the executive committee.

I understand that no guarantee has been given that the operation will be performed by a registered surgeon.

Journal of Health Politics, Policy and Law, Vol. 30, No. 1, January 2005
DOI 10.1215/03616878-30-1 © 2005 by The University of Chicago

REFERENCES AND NOTES

Human Risk and Management

(2) **Stomach Content**—Follow group 1 general anaesthesia until the responsibility of the anaesthetist is ensure that the stomach is empty. It is generally accepted that the stomach will have emptied four to five hours after a meal. This period should have elapsed since the last feed or drink was taken before the premedication is given. Meophen or meoperphen are causing stomach contents delay in stomach emptying. In this connection it should be remembered that certain reports claim delay in emptying so that even after eight or ten hours the stomach may not be empty. In these cases it is safer to assume that the time from the last meal to the time of the anaesthetic gives the best guide to the probable state of the stomach contents.

In cases where the stomach may not be empty a tube should be passed and the stomach evacuated. A large tube such as No. 12 oesophageal tube should be used. A Ryle or Levine tube will be of little use unless its contents are fluid.

(3) **Tooth**—Ensure that dentures are removed before the patient is taken to the operating theatre. Break a nose of crowns or loose teeth and ensure they are still in place at the end of the operation.

(4) **Ring**—These should be removed to avoid injury to fingers when dissector. If they cannot be removed cover with sialogogues.

(5) **Premedication**—Premedication is given one to one and a half hours before operation and has two main objectives:

(a) To relax the patient and

(b) the prevention of sympathetic effects.

A well-localised patient will come to the theatre, in a drawing anaesthesia with a sense of well being and will require less time before to reach the desired level of anaesthesia. (Drugs used meophen, amethocaine, pentidine, barbiturates).

Paroxysms of sympathetic effects (sweat, vasodilatation) dry up the secretions which might interfere physically with the gauze捲 interchange in the lungs, or cause hypotension by inhibition of cardiac and other (posterior) arterial reflex vagal stimulation e.g. arrhythmias and possibly arrest.

Although atropine 1 gr and neostigmine 1/100 gr prove an effective premedication for most healthy young adults, each one should be judged on its merits. The shocked or toxic patient will not need much sedation but, pentidone 50 mg, and atropine 1/100 gr may prove sufficient.

In severe degrees of shock drugs should be given intravenously because absorption of subcutaneous or intramuscular injections may be delayed due to poor peripheral circulation, and may not take effect until recovery from shock is evident. Muscular compounds should only be given to relieve pain—where pain is absent give atropine 1/100 gr alone. If atropine and morphine are used dilute the ampoule to 5 ml with water and inject slowly otherwise severe vomiting may occur causing further shock.

The premedication may have to be modified for the type of anaesthesia to be given and will be discussed under the various anaesthetic techniques.

Anesthetic Techniques

It is accepted that ether will be the main anaesthetic for maintenance of

anesthesia and therefore a description of the stages of anesthesia, which are best seen when using an open ether, will be given below. With more "Modern" techniques these stages are masked to a great extent.

There are Four Stages of Anesthesia:

Stage 1—From the beginning of induction to the loss of consciousness.

Stage 2—From loss of consciousness to absence of pupillary reflex.

Stage 3—From absence of pupillary reflex to paralysis of intercostal muscles.

Stage 4—From paralysis of intercostal muscles to respiratory failure.

It is during the second stage that most of the diffusion of inhaled gases occurs. Muscular spasm occurs only in this stage and may give rise to breath holding, chewing, ptomaine spasm of jaw muscles, rigidity of limb spasm, clonus and propulsive movements. Coughing, salivation, swallowing, sneezing and vomiting may also occur in this stage. The eyelid reflex (interruped closure of the eye when the upper eyelid is lifted by the fingers) is present and the eyeball shows marked movement. The size of the pupil is variable.

The third stage is called the Stage of Anesthesia and is subdivided into three phases which carry distinct levels of anesthesia. In the first phase, breathing occurs in a mechanical regularity and is known as "automato breathing." There is no coughing, swallowing, retching or vomiting. The eyelid reflex is absent and the movement of the eyeball gradually dies out as the lower border of the plane is reached. The muscles of the pre and neck are relaxed but there is no abdominal relaxation and the patient may move in response to painful stimuli.

The second phase is characterized by the relaxation of the abdominal muscles and it is in this plane that most operations are performed. The eyeballs are immobile, the pupils constricted and small. The hair of the tongue tends to fall back and obscure the airway due to complete relaxation of the muscles of the floor of the mouth.

The third phase is characterized by the paralysis of the intercostal muscles, which becomes complete at the lower border of the plane. Breathing becomes abdominal in character and may startles with the surgery. The pupils change from near normal to marked dilation. The cornea becomes dry and brittle.

In the fourth stage respiration becomes shallow and the interval between breaths increases until respiratory failure occurs. The heart continues to beat for a few minutes so that resuscitation can take place if resuscitation is promptly withdrawn all consciousness and automatic cerebral respiration. In this stage the pupils are widely dilated.

Open Ether

Pretreatment: Atropine 1100 gr alone or in addition to barbiturate induction with open ether may take up to forty minutes and is an uncomfortable experience for the patient. In ten minutes (and the number of 1/2 drs in ether

long, due to rapid evaporation of the ether the induction may be negligible impossible. For these reasons ether is not recommended for induction. D₂C₂ method is described for these occasions when only ether is available.

Cover the mask with 6-8 thicknesses of gauze. Encourage the patient to breathe normally and using a deep bottle, drop ether on to the mask as quickly as the patient will tolerate the increase in concentration until 100 drops per minute are being administered. If the patient objects to the nose contusion by coughing, gagging, breath holding or swallowing, lift the mask and allow two breaths of fresh air, replace the mask and proceed at a slower rate. Once the patient is unconscious a gauze pad with a hole for nose and mouth may be placed below the mask to reduce leakage between the face and the mask.

When surgical anesthesia has been maintained for 30-45 minutes the dropping rate should be reduced to 40-50 per minute and thereafter be controlled by state of anesthesia.

Ideally for abdominal surgery the breathing should be spontaneous, pupils normal and showing mid-dilatation. Ensure a good money ether by turning head to one side after relaxation of the phrenic and rectus muscles has occurred or, if this is insufficient, by use of an oropharyngeal airway and support of the phrenic.

Anesthesia

Thiopentone is an excellent anaesthetic for very short periods (2-10 minutes) or for the induction of anaesthesia when inhalation anaesthetics are to be used for maintenance. It can be used for longer periods but is not recommended unless the anaesthetist has had considerable experience in its use.

Thiopentone should always be used in 2½ per cent solution, i.e. 0.5 gms/gm. in 2 ml. To mix the solution draw the required amount of water for injection into a syringe and then inject it into the container holding the powder. Repeat two or three times until all the powder has dissolved.

A syringe with an ordinary needle and a fine fibre needle with a short bevel makes reconstitution easier.

Arm block

Select a vein in the arm particularly near to the antecubital fossa or, if there on the lateral side away from the brachial artery. Place a tourniquet on the arm above the site for anaesthesia and close arm with sponges. Insert the needle in the vein and withdraw a little blood to confirm its position. Release tourniquet and palpate over point of needle to exclude arterial pulsation. If in any doubt withdraw needle and start again. Inject 2-4 ml. and pause to judge effect and to ask patient if he is comfortable. Should the needle be withdrawn the patient will complain of pain down the arm—ask the patient to voluntary this information, never ask about pain as a leading question—his words evidence. If the patient is comfortable then proceed with the injection and anaesthesia is induced—relaxation of arm, absence of systolic reflex. Give a further 6-8 ml slowly. If the anaesthesia is to be

measured on open ether then present as under open ether. The cough reflex is still present so that the ether is stopped as the mask is quickly to the patient will tolerate the concentration of vapour.

This is a plus-one method of induction for the patient, and the required degree of anaesthesia should be reached in 30-45 minutes.

When thiopentone is used as the sole anaesthetic or for induction of anaesthesia and there are no means of actually isolating the lungs either use a central respiratory depressant such as morphine or the preoxygenation Give thiopentone 1100 gr alone or with a barbiturate such as nembutal 3 gr.

If a central respiratory depressant is used it is important to get a varying period of oxygen following the injection of thiopentone.

Chloroform—ether Induction

If thiopentone is not available than a mixture of chloroform and ether can be used for induction. The mixture should be two parts chloroform and three parts ether and should be regarded as a weak chloroform.

Proceed as for open ether but use the mask and mask sparingly—*i.e.* no occlusion necessary to use more than 40-50 drops per minute. Do not put a gauge pad on the face and if possible float about 300 ml oxygen under the mask.

As soon as the third stage of anaesthesia is reached change to ether alone and proceed as for open ether. The gauge pad can now be placed over the face in full open ether.

Thiopentone Nitrous Oxide and Oxygen Vapor

Premedication—Dioscorin 1 gr scopolamine 0.150 gr. One to one and a half hours before operation is a good premedication in the average case.

Anesthesia—Following I.V. thiopentone as described above supply 6 litres nitrous oxide and 2 litres oxygen per minute through the normal open circuit. Gradually open the top on the ether bottle until it is fully on then depress the plunger until the gases are bubbling through the ether. Proceed with the maintenance adjusting the amount of ether required by the signs of anaesthesia.

To prevent excessive cooling of the ether and therefore loss of concentration of the ether vapour a water jacket may be placed round the ether bottle. The temperature of the water should not exceed 30°C and need only be allowed near the boiling point of ether (38.3°C).

It is of great benefit to add ethanol (about 100 ml) to the water bath before introducing ether until the gases are bubbling through the ether. Triflow is less irritant to the mucous than ether and quickly dampens the pharyngeal reflexes.

The gas flow (nitrous oxide and oxygen) must not be allowed to drop below the minute volume of the patient (i.e. about 7 litres otherwise there will be a build up of carbon dioxide). Of this flow oxygen should be at least 20 per cent to ensure a concentration of 20 per cent in the lungs.

To prevent rebreathing and a consequent build up in carbon dioxide concentrations in the gases (finished the rebreath valve should be in the fully open position).

Thiopentone Nitrate (Nembutal and Quargen, Trilene)

This is a very useful anaesthetic where no relaxant is required up to body surgery.

Induction:—Dissolve 1 gr. thiopentone in 1250 gr.

Following induction of anaesthesia with thiopentone, give a flow of gases of nitrous oxide 8 litres and oxygen 2 litres per minute then turn on halothane until it can just be detected by smell. Trilene is a good anaesthetic even in maximal concentrations and it should not be used in high concentrations. With the higher concentrations of inhaled anaesthetics becomes rapid and shallow followed by cardiac arrhythmias—the commonest being bradycardia and pulselessness. Should the respiratory rate exceed 30 or a cardiac arrhythmia occur, trilene should be turned off and the nitrous oxide flow increased to 2 litres per minute. Trilene must not be used in a closed circuit because it reacts with carbon dioxide to form dichloroethylene which causes cerebral circulatory failure.

General Anaesthesia Combined with Local Anaesthesia

In this technique a light general anaesthetic is used and relaxation is obtained by the use of local anaesthetics. For example for an appendicectomy 40-50 ml. of 1 per cent. xylocaine injected directly into the abdominal wall round the incision will give adequate relaxation. Local anaesthetics used in this way enables the patient to be kept at a lighter plane of anaesthesia and thus the total amount of ether used is reduced and the patient's general condition is better after the operation.

Complications and Their Treatment During Anaesthesia

Toxicity occurs in second stage only.

- (1) Remove mask and turn head to side
- (2) Lower head of table
- (3) Insert 1 Meissner gag well back on molars
- (4) Scrub the mouth thoroughly and use suction if available
- (5) Replace mask and continue anaesthesia as quickly as possible.

Respiratory Spasm

May be due to:

- (1) Tracheal irritation at the endotracheal tube. Remove mask, allow two breaths of air, proceed with a low irritating concentration of vapour
- (2) Surgical trauma at too light a plane of anaesthesia. Deepen anaesthesia
- (3) Respiratory from third to second stage of anaesthesia. Deepen to third stage

Respiratory spasm usually occurs as a partial closure of glottis, and the above remedies will usually suffice. However if closure of glottis becomes complete

Stop anesthetic and breathing is re-established
Give oxygen under pressure if possible

If means of giving oxygen under pressure are available give CO_2 -copper and
8-10 c.c. sodium IV. Sodium will relax the spasmodic laryngeal and
respiratory efforts for 4-5 minutes so that positive inflation of the
lungs must be continued until automatic breathing resumes.

Tongue Obstruction

Muscle spasm due to the base of the tongue obstructing the airway.

- (1) Turn head to side
- (2) Hold jaw forward
- (3) Insert oropharyngeal airway
- (4) Insert nasopharyngeal airway

Sputum

May follow injection of thiopentone especially if a central depression has
been used in premedication. Give oxygen and artificial respiration. With
incentives the sputum usually passes off in a few minutes.

Congestive eye

Anesthetic eye may be caused by damage to the cornea by press
urer anesthetic; finger, ether, chloroform, blood, gas or thiopentone.
It is the anesthetist's responsibility to protect the eyes during the anaesthetic.
A drop of sterile saline oil should be instilled into each eye at the end of an
ether anaesthetic. The oil will cleanse ether and so protect the eye. Never
wash oil out of the eye during the anaesthetic or the vapour will be dissolved
and cause irritation to the conjunctiva and cornea.

Shock

May be due to too light a plane of anaesthesia, loss of blood or body fluids.
(1) Make sure the anaesthesia is deep enough
(2) Ensure a good circuited circuit
(3) Intravenous saline may be required
(4) If haemorrhage is critical IV. dextrose may be used (blood must be
taken from the arm, mouth or dental extraction with the hand)

Lytic Convulsions

Occur very rarely, aetiology unknown, only occur in deep ether anaesthesia.
Convulsions start in muscles of the face and spread rapidly to the limbs.
May be very violent. Respiratory centre, cardiac action becomes feeble and
profound confusion quickly becomes critical.

Treatment

- (1) Stop anaesthesia
- (2) Give O_2 under pressure if possible
- (3) Inject intravenously just through thiopentone in diluted concentration

Anatomical Dissection

When the surgeon has painted both sides before pulling off the arm and hand. There may or may not be blanching of the hand and fingers of the fingers.

Treatment:

Stop bleeding but leave needle in place
Inject 5 ml. 2 per cent. procaine or 10 ml. 1 per cent. prilocaine through the needle.

Wrap both arms in cotton-wool and bandage to prevent heat loss.

Consult with the emergency operator.

Do a brachial plexus block to paralyze the non-vasodilated sympathetic fibers.

Three hours after operation or as soon as possible after the period starts anti-coagulant therapy.

Refresher Course in Thoracotomy:

Refresher courses in thoracotomy of two weeks duration are given at the Naval Hospital. Application for these courses should be made to the Medical Officer in Charge.

**Steroid Anesthesia
THE USE OF PRESUBEN (HYDROXYDIONE) AS A
BASIC ANESTHETIC**

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Journal of Clinical Psychopharmacology, Vol. 27, No. 4, December 2003, pp. 479–480

The anesthetic action of steroid hormones was first demonstrated by Selye (1911). Progesterone in particular had a marked effect while in addition it was devoid of the hormonal properties associated with such compounds (Selye 1942). Lushkow et al (1969) later found that the steroid 21-hydroxyprogesterone (20 deoxo-hormonone) a derivative of progesterone, not only had a powerful anesthetic action in animals but also possessed such attributes as a wide safety margin, lack of atony, and minimal post-operative depression. Shortly afterwards it was introduced into clinical anesthesia. Since Murphy et al (1965) reported the first series of surgical patients anesthetized with this drug there have been many reports of its use in human anaesthesia. The present report concerns the administration of the anesthetic agent to patients in a rural hospital.

Editorial Team Page

Chemistry. Hydrocortisone is the sodium salt of 11-hydroxyprogesterone-3,20-dione hemisuccinate. Provera and Vaginal are two trade names for its sodium salt which is presented as a soluble, non-crystalline, white crystalline powder. It has a sol. of about 2.8, and its structural formula is as follows:



indicates the closest relationship to such physiologically substances as electrolytes, proteins, hydrocarbons, and deoxyribonucleic acids. Protein differs slightly from water in certain physicochemical ways and appears to be more plentiful to tell time it can be given by single microvillus injection rather than by many microvillus doses, which is required for water.

Pharmacology.—This can be only briefly reviewed before the clinical application of the steroid is described. The relationship of the several hormones is of obvious importance. Despite its chemical structure it appears to be devoid of endocrine activity, as demonstrated by the studies of Garsdorff *et al.* (1959). In man, no significant alteration in electrolyte balance occurs in the blood or urine following its administration (Lilford *et al.* 1955) while the effect on the blood sugar level is negligible (Taylor and Shearer 1956; Pfeifer 1957).

The effects upon the cardiovascular and respiratory systems in cats and dogs have been studied by Pan *et al.* (1955) and Dux and Axon (1957). No major alterations of respiratory rate and volume or heart-rate and rhythm were produced by injection of doses within average therapeutic limits. Transient falls in blood pressure were noted during the injection. But hydrocortisone was much less potent than the corticosteroids in this respect. Similarly, Taylor and Shearer (1956) found that following the administration of hydrocortisone, the sustained rabbit heart showed only one-fifth of the depression attributable to theophylline.

Pan *et al.* (1955) also studied the effects of giving the steroid to dogs over a two-week period. No histological, biochemical or haematological abnormalities resulted.

Lilford *et al.* (1955) studied the effects on the autonomic nervous system, and concluded that there was no major effect on this system in dogs. Taylor and Shearer (1956) found no effects of significance in anaesthetized guinea pigs, rats and cats. Concerning the central nervous system, it has been found that a only consideration of short duration with little post anaesthetic depression is produced in animals. Pan *et al.* (1955) again observed that hydrocortisone was much less toxic than theophylline while its therapeutic index was found to be two or three times greater than that of the theobutermann. In man electroencephalographic studies have shown that the steroid and theobutermann produce very similar effects on the central nervous system (Bellville, Hurland and Royston 1958), and Garsdorff *et al.* found that changes in arterial blood flow, oxygen uptake and glucose utilization were of the same order in those produced by hydrocortisone. Biochemical studies, however, do point to a subtle difference between the steroid and theobutermann, for while the action of theobutermann is probably induced through a reduction of cytochrome oxidase activity the site of action of the steroid upon the "rate law of biological oxidation" is different and is thought to be at the dehydrogenase level (Garsdorff and Elixson 1947; Haynes *et al.* 1959).

In summarizing the review of the pharmacology, it should be emphasized that hydrocortisone appears to be inactivated in the liver (Kleiby and Tomkins 1956) and excreted through the kidneys (Garsdorff *et al.* 1959).

On the basis of such considerations, it appeared reasonable to use the steroid as a local anaesthetic in clinical practice. It then became possible to observe more of its effects in man and to attempt to evaluate its position in anaesthesia.

HYDROGEN CYANIDE AS A BRAIN ANESTHETIC

Technique of Administration

1 per cent. 10 per cent. and in the case of a 6-year-old, 2.5 per cent. solutions were used. Physiological saline at room temperature was the solvent. The technique of injection was based on that suggested by Birchfield (1957) and elaborated by Gaffey and Lorraine (1958). Prussic acid was injected rapidly through a large-bore needle into a vein in the antecubital fossa. The injection taking 20 seconds or less, it was followed by 3 ml. of either saline or 1 per cent. prussic acid which served to flush the drug along the vein. In a further attempt to remove the drug from the vein, the patient was asked to open and close his fist while the anaesthetist flexed the arm and massaged the associated forearm and upper arm towards the shoulder for about 30 seconds. This new technique of injecting in strong solution directly into a vein rapidly, appears to have vastly decreased the development of theoninaphilism, which was often the result of the earlier technique of using an intravenous infusion, the procedure naturally taking longer.

In all cases, single doses were given. Dosage was calculated according to body weight, the solubility of 1 to 8 mg./lb. for the average patient being used, as recommended by London (1954). Prussic acid was used continuous 1 gr. neogelatine (1150 gr. except in the case of a 6-year-old boy who received an appropriate dose of these drugs).

26 patients were included in this series. Their ages ranged from 6 to 46 years, the 16-year-old being the only paediatric. All were males except one 12-year-old woman and all were British except for one sick Chinese male. Physically none could be regarded as poor risk cases. The operations are summarized below (see table) together with a table of the dosage of prussic acid and neogelatine.

Description of Anaesthesia

Following the injection the patient becomes increasingly drowsy. Sleep invariably follows within 3 minutes following being characterized by the gentle onset of sleep. During this period there are no major alterations in the respiratory and cardiovascular functions, the skin is warm and pink, and the jaw muscles become relaxed. Immediately after the patient has fallen asleep there is sufficient sedation to allow a Glavin needle to be inserted. The early stage of anaesthesia is also characterized by depression of the pharyngeal and laryngeal muscles, so much so that intubation and ventilation can often be performed without prior administration of a relaxant. In the present series, intubation was carried out under the influence of prussic acid in 8 cases; in a further 7 small doses only of relaxants were given in addition before intubation was attempted. Depression of these reflexes is not complete and intubation is sometimes accompanied by coughing or lachrymation though never prolonged and the vocal cords while widely separated retain their mobility.

Airway maintenance or the insertion of an oxygen, nitrous oxide and oxygen

Table 10. Comparison of Results in Boxes

Operation	Age (yr)	Weight (kg)	Proportion per 1000 operations		Number of operations	Number of patients
			Open	Closed		
1. Abdominal hernia	22.8	50.0	430 37%	112 33%	112	112
2. Appendicectomy	23.0	51.0	920 77%	288 22%	120	120
3. Peritonitis	23.0	51.0	920 77%	288 22%	120	120
4. Removal of rectal lesion	28.0	51.0	920 77%	288 22%	120	120
5. Hysterectomy	30.0	50.0	430 37%	112 33%	100	100
6. U. Ileostomy	31.0	50.0	920 77%	288 22%	120	120
7. Sigmoid	29.0	51.0	920 77%	288 22%	120	120
8. Sigmoid	29.0	51.0	920 77%	288 22%	120	120
9. Removal of intestinal lesions	30.0	51.0	920 77%	288 22%	120	120
10. Sigmoid	29.0	51.0	920 77%	288 22%	120	120
11. Appendicectomy	29.0	51.0	920 77%	288 22%	120	120
12. Closed rectal site	27.0	51.0	920 77%	288 22%	120	120
13. Operations on intestinal lesions (including)	29.0	51.0	920 77%	288 22%	120	120
14. Primary perforation	29.0	51.0	920 77%	288 22%	120	120
15. Delayed colitis	29.0	51.0	920 77%	288 22%	120	120
16. Removal of fecal masses	29.0	51.0	920 77%	288 22%	120	120
17. Appendicectomy	30.0	51.0	920 77%	288 22%	120	120
18. Appendicectomy	30.0	51.0	920 77%	288 22%	120	120
19. Cholecystectomy	30.0	51.0	1000 83%	170 17%	120	120

Resection performed in the majority of patients (percentage of resected patients) = (number of operations performed with 1 abdominal site resected) / (number of patients required to do a stage).

Open = primary perforation.

Delayed colitis = colitis.

Removal of fecal masses = removal of fecal masses.

Appendicectomy = appendicectomy.

Appendicectomy = appendicectomy.

Cholecystectomy = cholecystectomy.

are added. During the subsequent course of a procedure supplements of either pentobarbitone and chloralose are given as required, but a notable reduction of the dosage of chloralose as compared with the amount required during the commonly employed thiopentone-chloralose-muscinous mixture, is a definite and advantageous finding. Sometimes there is also a reduced need for pentobarbitone. Thus pentobarbitone can replace thiopentone and further the second appears to have both chloralose and analgesic properties. Murphy *et al.* (1953) believe that hydroxychloralose is a true anaesthetic agent, an extractive by its ability to control pain, chloral reflexes, produce relaxation and produce sleep, all without depression of vital functions.¹ Another advantage especially is abridgment and the net result is the ease with which respiration can be controlled, using only small doses of sedatives or adjuvants.

Behaviour of Respiration and Circulation

(a) Respiration.—No appreciable or gross changes were made but no obvious major alteration in respiratory rate or volume were detected. There was a tendency for respiration to slow slightly after the induction, the rate returning to normal soon or remaining so between 10 and 15 per minute. Pentobarbitone never caused apnoea or obtruse contrast to thiopentone.

Brown-South (1959) analysed the respiratory changes with a dry gas meter. He found that within 3 minutes of the injection there was an average fall in tidal volume of about 150 c.c.s. in the next 3 minutes a further slight fall might occur but thereafter little change was detected until respiratory exchange increased at a result of pain or lightning anæsthesia.

(b) Circulation.—In the series there were no major alterations of pulse rate or rhythm. This is in accord with the general experience of pentobarbitone workers. Some workers believe that a moderate tachycardia is attributable to the drug (Hydronotus 1957; Lundby 1958). Of the present cases a pulse-rate exceeding 100 per minute was noted in 5, in only 3 did it exceed 120 per minute. Of these latter one patient had a rate of between 100 and 125 throughout the operation, this was for the removal of an acutely inflamed appendix. Second being used as the relaxant, the other was a nervous individual who had a transient tachycardia of 140 per minute following tracheal and pharyngeal packing.

Blood pressure changes were also measured. A fall of up to 15 mm Hg. systolic pressure was a common, but not consistent finding after the injection of pentobarbitone. Thereafter there was often no further reduction and there was often a slight rise. No cases of hypotension occurred (the criterion being a systolic pressure of 80 mm Hg or less). The difference in pentobarbitone concentrations did not appear to be important. These blood pressure changes appear to be of the same order as those reported in the literature, the hypotension which has sometimes been observed is never severe, and is easily corrected by resuscitation.

Pain Operative Course

Return to consciousness after the operation took a variable period, when

operations had lasted for 90 minutes or more. In 14 patients in which, on other days, it varied from 15 minutes to one hour. The general conclusion is that in the post-operative period was nitrous oxide, there was no drug so successfully analgesic. Complications were few. One case of bronchospasm occurred following the accidental extravasation of insulin to 8.5 ml (30 per cent) protein, no cases of thromboembolism were seen although there were 3 instances of patient dislodgment of the cannula and the syringe, vomiting occurred in 3 cases (1 being the child who had received ether), constipation occurred in 3 cases (1 being the child who had received ether) and abdominal pain in 3 cases (1 being the child who had received ether). Following an appendicectomy in the seven, the result of transillumination appeared the same (normal).

DISCUSSION

Gamble and Rossau (1958) point out that the introduction of ether marked the first departure from the use of the barbiturates and the barbiturate and derivative gases intravenous anaesthesia became substituted in 1932. This alone is of interest, and its relationship to numerous physiological substances certainly merits discussion. Gordon et al (1951) in their study of the various metabolic effects of general anaesthesia reviewed the increasing knowledge of the effects of hormones on the central nervous system. From the annotated literature, the physiological "breaking" action of narcotics on cerebral metabolism certainly has some theoretical advantage over the pharmacological action of the chloral ethers. Another point of interest lies in the issue of well-being in the post-operative period (Kushley and Rossau, 1958). Lewman (1956) the former authors likening it to the euphoric of narcotics therapy. These authors also quote an interesting suggestion attributable to Dr. Kellman concerning the mechanism of optimal sleep "as yet undiscussed turned to account during the study and sleep associated with skeletal atony which builds up to a sufficiently high concentration to suppress the muscle-stimulating centre which, in turn can no longer activate the centre, so that sleep occurs".

It thus is a very pleasant as certainly an effective anaesthetic agent such as an effervescent that Bryce-Senck (1959) believes is to be indicated for induction of anaesthesia in short duration anaesthesia resulting from. Preoxygen is invariably combined with the oxygen. With preoxygen a peaceful and comfortable form of anaesthesia is permitted so that an alternative intra-synapse anaesthesia is available. The general has certain advantages, summarized by Gamble and Rossau (1959) a high therapeutic index, lack of respiratory depression, avoidance of pharyngeal laryngeal and bronchial reflexes, the ease with which controlled respiration can be effected and a less unpleasant recovery period for the patient. To these might be added the reduced need for related drugs which today are accepted as being not without risk. The slow induction is also recognized as an advantage in paediatric cases (Lundin 1958; Gamble and Rossau, 1959); since respiratory collapse and death do not occur with the injection of pentobarbitone.

with the similar use of thiopentone. Pentobar therefore can be regarded as a preferable anesthetic in some cases. Reviewing the literature it has been indicated in particular for laryngectomy and bronchotomy laryngeal and thyroid surgery, obstrucive surgery including Cricotracheal section, cases of respiratory insufficiency, diabetic mellitus, and goutful cases.

The introduction of pentobar has largely removed the disadvantages of the earlier method of stirred anesthesia. When thiopentone was given as a weak solution by intravenous drip, Colley and Lerman (1959) described that the slow rate of induction resulting from the administration by continuous drip, the marked tendency to bradycardia, unless very weak solutions were used, and two or pulse-rate and occasional falls in blood pressure especially in elderly patients. Of these, bradycardia is now the main disadvantage of the second due to its intrinsic properties. However, the work of Shattock (1957) and Colley and Lerman (1959) has shown that even this is reduced if a special technique is used. With carefully graduated doses, there is now a greater control of anesthesia and especially in elderly patients cardiovascular changes are less marked than with the earlier method of stirred anesthesia.

Whether the anesthetic agent will displace the well-tried inhalation techniques is doubtful at any rate in the near future. Ogdenback (1957) considered that the delay in onset of action, the need for a dosage schedule and the associated prolonged postanesthetic sleep would under many circumstances be avoided using established techniques. Certainly pentobar could not be used for the acute induction techniques favoured by many in cases of acute intestinal obstruction and emergency Cricotracheal section.

However, the introduction of stirred anesthesia does seem to be an advancement of anaesthetic techniques. Whatever the future position of stirred anesthesia is in in the meantime existing or future can more firmly of medical progress which for the anaesthetist is almost entirely directed towards the better welfare of his first duty towards the patient. By common agreement

Summary

The use of the stirred anesthetic pentobar is described in a series of 20 patients in a naval hospital. The pharmacology is reviewed and an attempt is made to evaluate the position of the anesthetic today.

ACKNOWLEDGEMENTS

I am indebted to Surgeon Captain T. G. Vandell R.N. Medical Officer in Charge, Royal Naval Hospital, Hong Kong for permission to publish this article.

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CLINICAL TRIAL IN PEPTIC ULCERATION OF
"STELABED" A COMBINATION OF TRIFLUOPRERAZINE
(STELAZINE) AND ISOPROPANIDE IODINE (TYREMIDIC)

BY

Sergeant Commander R. D. ARDREY, R.N.

The incidence of cases of peptic ulcer in the Service can be a difficult and distressing experience. Under certain conditions the stresses and strains of Service life may be overwhelming and it is not surprising that peptic ulcer is a relatively common finding among young personnel. Even a present-day study of the younger individuals may find themselves more especially when doing compulsory service exposed to an environment which is to them difficult and strange. There is no doubt that in certain susceptible individuals environmental changes readily produce gastro-intestinal complaints and manifest under the appearance of peptic ulcer. Treatment cannot be directed entirely against possible infection, although it is recognized that a many common discharge from the Service may boil or run or ulcer. At a given time by eliminating procedures it would all cases of peptic ulcer there would be wise then to consider the effect of the environment on the patient and either to alter this environment or to build up the resistance of the patient so that he may withstand what might appear to him to be unsympathetic surroundings. The role of the tranquillizers thus assumes a degree of importance.

There have been several publications on the value of Trifluoperazine (Stelazine) as an effective tranquillizer in the treatment of psychotic and psychoneurotic conditions (1, 2, 3, 4). The place of the synthetic muscle relaxant Isopropanide Iodide (Tyremidic) in the treatment of peptic ulcus complaints is already established in clinical practice (5, 6, 7). A trial of a combination of treatments with these two drugs was therefore carried out at the Royal Naval Hospital, Haslar. "Stelabed" combining both drugs in a single tablet contains 5 mg. "Tyremid" and 1 mg. "Stelazine". Both these drugs are relatively long acting each in its own right and it was considered that a total daily dose of 10 mg. "Tyremid" and 2 mg. "Stelazine" could be considered adequate for treatment in addition to the existence of antacids and control of the diet. A total of 27 naval personnel suffering from peptic ulcers were treated over a period of four weeks each with "Stelabed" and the results are presented in this review.

Methods

Choice of Patients.

27 patients were selected at random from new cases admitted for investigation and treatment at the Royal Naval Hospital Haslar. All patients had had the diagnosis established by radiology. 24 patients had duodenal ulcers, 3 had "empty" duodenal ulcers where the ulceroid could not be definitely established, and 1 had a pyloric ulcer.

It was not possible to prevent voluntary treatment being given at the same time as Stomach and most of the patients took antacid in the form of magnesium trisilicate three times a day. A few patients were given phenacetin tablets for the purpose of additional sedation, and in most instances a modified pepto-bismol diet was prescribed.

Patients were treated for four weeks with 1 tablet of "Sedulac" twice a day and, where possible, were followed up more at a follow-up. At the first assessment special record cards were completed and entry made on the general condition of the patient with the previous history, previous treatment and the symptoms. At weekly intervals and at the follow-up, as on the first occasion, notes were made on the presence of nausea, vomiting, abdominal pain, diarrhoea, or constipation, bowel action, weight, appetite, haematuria and appearance of the tongue. It was possible thus to have a record of the main symptoms and signs throughout the course of treatment. The patients were not informed of the nature of the tablets and no special importance was claimed for the method of treatment. The results held established by clinical impression compared to pressure therapy where a tranquiliser drug had not been incorporated in the treatment.

Results.

21 patients were investigated and Table I presents the results obtained in almost every case. Treatment was continued for four weeks and a final assessment was then made. There was no long term follow-up of the symptoms and signs but in several cases radiological findings were available where barium meal examinations were subsequently carried out.

The results are recorded as "very good," "good," "fair" and "no change." In the "very good" results the patients became symptom-free and were discharged from hospital supervision, there were 13 in this group. There were 8 patients recorded as having "good" results. In these patients all the symptoms had cleared up except for an occasional complaint of mild indigestion and abdominal discomfort.

5 patients were recorded as having a "fair" response and these continued to complain of some pain and abdominal tenderness. One patient was not affected by treatment and his condition improved rapidly unchanged. The X-rays of 15 patients were available for comparison with their previous results. In 13 patients the ulcers were no longer demonstrable in 3 patients the ulcers had become smaller and more difficult to detect. 12 patients were still X-rayed after the period of treatment. Nausea and vomiting symptoms

Clinical Trial on Paper Dilution of Sustibol

Table I.—The Power of Sustanol vs. Power Diluted

No.	Duration of		Response	Results		
	Age	Disease		Days	Good	Poor
1	25	10				
2	26	3 (1)				
3	22	0				
4	20	0 (1)				
5	26	0 (1)				
6	27	4 (1)				
7	21	0				
8	22	1 (1)				
9	24	0				
10	21	1 (1)				
11	26	0				
12	24	0				
13	21	1 (1)				
14	24	0				
15	21	1 (1)				
16	24	0				
17	21	1 (1)				
18	24	0				
19	21	1 (1)				
20	24	0				
21	21	1 (1)				
22	24	0				
23	21	1 (1)				
24	24	0				
25	21	1 (1)				
26	24	0				
27	21	1 (1)				
28	24	0				
29	21	1 (1)				
30	24	0				
31	21	1 (1)				
32	24	0				
33	21	1 (1)				
34	24	0				
35	21	1 (1)				
36	24	0				
37	21	1 (1)				
38	24	0				
39	21	1 (1)				
40	24	0				
41	21	1 (1)				
42	24	0				
43	21	1 (1)				
44	24	0				
45	21	1 (1)				
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47	21	1 (1)				
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168	24	0				
169	21	1 (1)				
170	24	0				
171	21	1 (1)				
172	24	0				
173	21	1 (1)				
174	24	0				
175	21	1 (1)				
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so that this group, in contrast to those on hypnotics, were less unchanged. These results confirm a hypothesis of ours of ours. The use of a potent anticholinergic drug does not reduce enuresis, there does not seem to have produced a good response to them. It would appear that the addition of a tranquillizing agent such as Sedaline, has not only increased the enuresis rate but also had a beneficial effect on the enuresis rate of the patients treated. It is questionable whether 2 mg. of Sedaline is the ideal dose, in this combination given over twenty-four hours. It is always a disadvantage in a series of cases such as this not to alter the dose of the individual constituents of the tablet given. There is sufficient evidence to show that Tyramide is a valuable long-acting preparation and in doses of 5 mg. b.d. is an adequate form of therapy for cases of pyrexia alone. Although Sedaline is as much a long-acting tranquilizer it is possible that an increased amount might be needed to control a psychosomatic background (Muir, 1959).

Although only 22 patients form the basis of this investigation there is sufficient evidence in relation to previous experience to show that Sedaline may be a more favourable method of treatment than by giving an anti-cholinergic drug alone. In certain cases the tranquilizing effect was obvious and may certainly have had a place in softening the symptomatology.

SUMMARY

(1) "Sedaline", a combination of a synthetic anticholinergic, "Tyramide" and "Sedative", a tranquillizer, has been used for the treatment of 22 cases of primary enuresis.

(2) The response to therapy after a period of four weeks treatment showed very good 11, "good" 8, fair 4, and "no change" 1.

(3) Radiological observations on the bladders of 15 patients who were X-rayed both before and after treatment roentgeno-ureter was observed in 13 and improvement at 2.

(4) It is suggested that "Sedaline" is a useful preparation for the treatment of primary enuresis together with certain therapy and a suitable dietary regime.

ACKNOWLEDGEMENTS

I am grateful to the Medical Officer in Charge Royal Naval Hospital Haslar for permission to record these findings, and to Smith Kline and French Laboratories Limited for supplies of the drug employed.

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Clinical Notes and Cases

AN UNUSUAL INJURY OF THE LARYNX

60

Surgical Committee: G. S. HAYNE, M.A.

G. W. M., a Petty Officer aged 30 years was admitted to the Royal Naval Hospital, Haslar.

HISTORY.—The usual history was that he had been sleeping on the back, while riding his bicycle and that he felt that a piece of iron had punctured him, just on the side of his mouth below his chin. This had occurred the previous day. Further questioning revealed that whilst riding a piece of iron had been inadvertently knocked on the neck by someone passing behind him, but had only jarred up the tendons of the back round the larynx hitting the back, with but small

He was seen finally at an out-patient at 11 a.m. when a large epiglottic swelling resting on the left side was noted. There was no swelling otherwise on the right side. The extent of the swelling was not clear and admission to hospital for observation was accordingly advised.

When seen on admission at about 3 p.m. there was none, swelling in the anterior region on the right side which had not been present previously. Right vocal folds closed at diagnosis but he had been using dysphonia for weeks. The oral capsule was complete and when traction made the cap on the right side to the post-nasal space. No other evidence of any other foreign body was seen.

He was treated with full rest, reduction of diet, between 2000 and 2000 mg and no smoking.

By next morning he, having slept after the accident, he felt much more comfortable and his dysphonia and pain had subsided. On auscultation the swelling was seen to be entirely gone (seen on the region of both arytenoids and the right epiglottis) but both vocal folds were entirely normal and moved normally. The swelling had decreased considerably over the previous day. There was a patch of fresh fibrin on the posterior surface of the epiglottis remaining afterwards. It was concluded that the swelling must have been produced by the back digging into the posterior surface of the epiglottis—despite the fact that there was no history of a history of epiglottitis. He was operated through:

On the following day the swelling had again increased and he developed total dysphagia and some stridor. It was surmised that the swelling would continue to enlarge and should have an eventual disastrous. He was admitted to hospital and died 10 minutes after the operation.

DISCUSSION

No report of any similar case has been found in the literature. Koch (1880) records a case of laryngeal injury caused by the heel of a bay horse prancing it from the external surface of the neck.

Editorial Committee

Mr. Justice Sir Alan R. Munro; Rear Admiral G. Philip, Q.M.S., R.N.;
Professor C. J. Williams, also several

REFERENCE

Kane P. (1970). *Int. Med. Circular*, 2, 27-30.

THE USE OF VARIDASE IN ORAL SURGERY

BY

Senior Officer (D.E.B.), M.R.C.S., F.D.S.R.C.S.

After any surgical operation there is immediate bleeding from the blood vessels involved, and the extravasated blood in the intercellular spaces attracts water and fibrin, which causes an oedema of the adjacent tissues. Oral surgery frequently involves bone as well as the soft tissues, and is often required at sites where operating room is restricted. The required manipulation and surgery in these inaccessible regions results in unavoidable trauma which over stimulates the subsequent inflammatory reaction. Status of blood and lymph vessels is a result of restricted circulation, the process of healing is impeded, and conditions favourable to bacterial growth prevail [1].

A reversal of the process of inflammation and oedema is induced by the administration of Strepokinase. Although the mechanism by which it acts is not known, it is imagined that a protease in the blood or saliva reacts with Strepokinase to produce an activator which catalyses the plasminogen in the saliva or blood and converts it into plasmin. It is the plasmin which produces a lysis of the fibrin clot in the local vascular and lymphatic systems, and at the same time reduces the viscosity of the oedema. These two factors increase the resorption of fluid by improving the local circulation. The improvement will also permit the passage of bacteria from the site of injury to the rest of the body, as well as the same ion, allow antibiotic drugs to reach any source of infection at much greater concentrations [2].

The extramucosal injection of Strepokinase prior to the surgical removal of teeth has been found to be statistically efficacious, although it may be responsible for pain and tenderness at the injection site and a rise in temperature

In some, a mucogingival side-effect occurred and one patient exhibited the symptoms of a localised spread of infection [3].

Sugarpaste, in the form of Vanadate tablets penetrates the oral mucosa and subsequently enters the gingivae, and by the method of oral adhesives where the enzyme is introduced to the site of inflammation. It is destroyed by the gastric juice but before it is digested the abundance of salivary phosphatase is ample for the Sugarpaste phosphatase reaction to take place [4]. It is claimed that the bleeding and clotting times are unaffected by Vanadate, and that the proliferative results are unusual.

In the series of cases reported in this paper patients were chosen who had unerupted third molar teeth which by X-ray evidence appeared to be severely impacted on each side of the jaw. Following the removal of each tooth by normal surgical procedure a reaction of excessive edema, pain and trauma was to be expected. Before operation the clotting time and white blood cell count of each patient was measured. An extract of the teeth on the side which appeared from the radiographs to be the easier surgical problem (and which proved to be so in practice) was enucleated under anaesthetised anaesthesia and with penicillin cover, but without the administration of Streptomycin.

A few days later the teeth on the opposite side were extracted using similar methods of surgery, penicillin cover and anaesthesia, but with the addition of Vanadate therapy. Both tablets were given in all. One tablet of Vanadate (0.050 mm of Sugarpaste) was allowed to dissolve in the buccal sulcus at 1600 and 2000 on the day before the removal of the teeth. The operations were carried out at 0915 and on that day the patient was given a tablet of 0000 (0.01 mm of Sugarpaste) and in addition at 0800 and 1200 on the day following. The patient was told not to swallow saliva for at least five minutes after placing the tablet in the buccal fold.

RESULTS

Pre-operative X-rays and post-operative photographs of three typical cases are shown in fig. 1 to fig. 9.



FIG. 1 (left) and FIG. 2 (right) Pre-operative radiograph. The condition of the commissural teeth differs from the condition of 3.



Fig. 7. Child, 1½ years old, showing complete loss of normal reflexes.



Fig. 8. Child, 2½ years old, showing complete loss of normal reflexes, except for pupillary reflexes. (2)



FIG. 4. Intraop (2) — Preop graft, radiograph — Postop graft



FIG. 5. Postop (2) — Postoperative facial view showing excellent (1) bone graft bony grafting



Fig. 1 (Case 1) ... One year following removal of orthodontic headgear, the occlusion is stable without braces.



Fig. 2 (Case 1) ... Periapical radiographs. (a) = partly treated.



Fig. 10 (left). Young man seen by Tissot in 1886, now aged 30, in 1916, and again in 1926.



Fig. 11 (right). Same young man, living outside of Paris, photographed in 1926.

Case 3

A 13 year old boy had undergone for the removal of a lumbar intervertebral disc a laminectomy of the second lumbar vertebra and a ventral decompression of the second lumbar disc (Fig. 12).

The 13 year old was admitted to the hospital on a change under contract conditions on July 1, 1941. He had been able to get around without difficulty for the previous six months and although unable to walk and stand up (Fig. 13) he was given his usual diet which consisted of two large helpings of bacon, eggs, sausages and biscuits (Fig. 14). The following day the patient was paralytic and in severe distress (Fig. 15). His bowels had disappeared by the next day.

The third week on the 14th he was able to stand without difficulty, but when given his usual diet he passed stool. It seemed to be a longer interval than that in the other two but finally after four days though walking was present (Fig. 16) this action was painful, and he could stand for much longer. The next morning constipation and the following day constipation was almost absent. The 16th and 17th the bowels were normal.

Case 4

A 13 year old German complained of intermittent low back pain on the side of the face. Radiographs revealed three unerupted third molars, two horizontally impacted lower, and a normally impacted upper right. The upper left wisdom tooth was erupted (Fig. 17).

Under anaesthetized conditions and protection about the right and lower wisdom teeth on the left side were removed. The upper teeth did not present a problem. The lower teeth were removed by the side from the tongue, and a tumor, removed. During this time there was a brief swelling over the angle of the jaw (Fig. 18) and the head body were normal and present. Fragments from small teeth were preserved for a forty-eight hours the swelling had increased and by 5th week Recovery was slow and post-operative treatment was continued for another.

On the right side the teeth were removed as before but with freedom of speech. The upper molar was unerupted at first, and the removal of the lower was a more difficult operation than that on the other side. This second, very painful-one day or constant hemorrhage. After removing these there was swelling, the right arm was rather stiff, it did not sleep last night. There was little nausea, he did however that after the previous operation and the following day the swelling was considerably less. Recovery was rapid.

Case 5

An 18-year-old White was referred for the removal of four wisdom teeth. Radiographs showed that both mandibular teeth were more completely impacted. The upper third molar was in mesio-occlusion posterior, buccally, the right molar inclined and the left completely unerupted (Fig. 19).

Under anaesthetized conditions and protection over the upper and lower right third molar was applied. There was an apparently free range four hours later there was nausea and a brief painful swelling at the angle of the jaw (Fig. 20). The patient was given fragments from small teeth, and at forty-eight hours the swelling and nausea had increased. This condition slowly improved with resolution over the next few days.

At 4th day the wisdom teeth on the left side were removed using the same operation, protection, but with the addition of Tourniquet and tye. Again the post-operative bleeding, at eighty-four hours was slight (Fig. 21) and there was no pain or distress. At thirty-six hours all symptoms had practically ended.

It was evident that no side motions were caused by the resection of one wisdom, in the others distended. By comparison with the results obtained with the distended side of the mouth, good speech, walking a few steps and developed nausea. There was evidence of pain, the patient who never complained had claimed he had left them off and forgotten.

ACKNOWLEDGEMENT

The authors obtained in their case support the view that amikacin should be considered as a useful and effective drug. It is an expensive product, however, and the high cost may mitigate against its routine use.

ACKNOWLEDGEMENT

I have the permission of the Medical Officer-in-Charge, R.N. Hospital Chelmsford, Surgeon-Rear Admiral W.H.S. Pinckering, M.B.C.S., L.B.C.P., Q.H.P. to publish these notes.

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PERFORATING HYPERPLASIA OF THE DENTAL PULP "PINK SPOT"

III

Surgeon Commander (M) F. S. MARSHALL, R.N.

This is a comparatively rare condition where the hard tissues of an individual tooth are resorbed centrally and replaced by pulp tissue which remains vital. The proliferating pulp eventually penetrates through the enamel usually at the gingival margin. Calcification of the tooth due to the multiplying pulp showing through the thinned out enamel is a classic sign which is usually present. Not in the diagnostic description of "Pink Spot" being applied to the condition.

The crown of the tooth may become resorbed so extensively that a slight fossa may occur at from the root. Painful symptoms are absent.

Case Report

A Royal Navy Officer, aged 28, reported that he had recently felt a small hole below one of his front teeth. There was no pain, but he occasionally noticed an unpleasant taste from it.

One of his central incisors was slightly darker at the gingival margin than the adjoining teeth (fig. 1).



FIG. 1.—Showing a close-up view of a root system of *Carex* with a probe inserted into a cavity.

There was a small hole about the size of a pinhead. A thin pointed probe was introduced around the cavity showed a probe ring (fig. 2).



FIG. 2.—Showing a probe inserted into a cavity and a probe ring of *Carex* (× 1,250 magn.)

A probe could be passed easily and a short piece deep into the hole and probe itself and the probe ring held immovable. Rutherglen observed that a large probe ring had caused and obscured the base of the roots and top of the stem had been destroyed (fig. 3).

It would be expected now that some measure or injury must would break the mechanical connection between stem and root. The apical portion of the root and its ramifications have appeared to be normal. A gross and dangerous change was considered during the subsequent treatment of the case of perforating leprosy patient 1 of the probe of death.

Previous History:—The patient complained continually with severe, continuous, non-throbbing pain associated by having his leg raised. He did not exhibit any changes, in his body at the time nor had he experienced any trouble since the accident. A fine ulcer on the leg just anterior to the elbow which could not be seen.

Examination:—The perforation in the proximal femur was enlarged and the extensive pulp tissue of the knee and distal portion of the root was removed. The distal portion of the knee in the root had been destroyed and was no longer maintained by the fibrous and bony connective tissue of the muscle tissue. Proximally there was a loss of muscle beneath the knee margin and the tissue being retained from the pulp chamber was in contact with the peritoneal membrane.

The neurovascular canal no pulse and there was no evidence of capillaries. A temporary dressing was applied and a few days later the apical portion of the pulp was removed under local anaesthesia and the root canal filled. A gold placed over part of the fibula and the epineurial membrane sutured over the nerve-end with an interrupted suture into the fibular end avulsed. An acrylic cast fitting was then placed to encase the



Fig. 1. Radiograph of tooth No. 11, showing internal root resorption. Note the dark, irregular spaces of resorption, and the resorbed pulpal floor.

loss caused by both overextension of the pulp, and loosened or necrotic, the more extensive ranges of resorption, and so on.

Classification

Mamonov (1936) stated that the cause of this condition is very rarely understood. He mentions a case where the trauma departmental after orthodontic treatment fifteen years previously was a possible cause, and another instance where the preparation for an analized crown ten years before might have been the causing factor. In the one reported here, the connection with the injury twenty years ago is treated as the tooth had not been subjected to any form of dental treatment in the meantime.

From the same authority we gather that the implement used, which was caused by the patient, is not due to occult infection of the pulp. When the canal is first perforated the exposed portion suppures, but this is confined to the surface.

This view is supported by the radiographic appearance of the lack of apical infection and also by the subsequent clinical findings when removing the pulpal contents of both crown and root canal.

Boyle (1948) writing of tooth resorption of unknown etiology (descriptive nomenclature) states that "occasionally the last history reveals some accident, of trauma, that might have started the process, a small traumatic desorption,

instead of being injured may have become larger and gradually invaded the ultra-soft (Fouad) pulp. The process of granulation tissue within the teeth apparently coincides with resorption of the dentine from the roots, although in radiographs a sharply defined defect is seen inside the root which may or may not appear to connect with the shadow of the periodontal membrane.

There are differences between two types of resorption—cervical and central or peripheral.

In cervical resorption the focus lies in the pulp and is so-called transverse fibrous. Several series of such cases show that a perforation exists on the side of the root which communicates with the periodontal membrane.

In cases of peripheral resorption, the focus lies usually away from the root. If there is no secondary canal, the pulp may become involved but it may invades the process as far as the fundus (body) of the tooth and the pulp remains intact. In explaining the histopathology of the two types is follows: In the cervical type of resorption there may be a softening of the root canal, the pulp tissue is replaced by vascular granulation tissue and the blood vessels proliferate, and extend into channels of resorption penetrating deep into the dentine. These channels of resorption show the effects of marked exudation, namely the cavity thus formed leads ultimately to loss of the tooth.

There is apparently no difference between the way in which bone destruction is initiated and it is therefore unnecessary to differentiate the two cells associated with tooth resorption as either odontoclasts or osteoclasts. They are named osteoclasts (Bork 1949).

Conclusions

A case of perforating hyperplasia of the dental pulp is described. It appears to have been caused by trauma occurring some twenty years previously. Treatment was carried out which would seem likely to be successful so long as the resorption was of cervical origin because the use of activity the pulp was eliminated by this method.

In view of the process is of peripheral origin (partial perforation by periodontal tissue) and characterized radiographically by lack of evidence of the widening of the pulp canal, there would be some objection to a simple method of treatment as the resorptive process might continue or recur after removal of grosser caries.

ACKNOWLEDGEMENTS

I am grateful to the Medical Director-General of the Navy Service Vice Admiral Sir Cyril May, K.A.B., C.B., M.C., F.R.C.S., Q.M.S. for permission to publish this case and my thanks to the Dr. S. Instructor Lieutenant-Corporal G. A. Bright and Practical Assistant Sub-Officer D. T. Green who produced the photographs.

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AN UNUSUAL CASE OF PRIMARY BENIGN STRicture OF THE COMMON BILE Duct OF UNKNOWN AETIOLOGY

xxv

Sugden, Lestor and E. T. HESKETH, B.M.

Two unusual conditions in English patients employed as a salaried worker who first attended hospital in August 1959 at the age of 29 years with an attack of acute appendicitis for which a standard appendicectomy was done and from which he made an uneventful return to good health.

In July, 1959, he was engaged in Rome, Italy, preparing for a non-specific skin examination for abdominal, uterine and bladder disorders which lasted four weeks. Nothing unusual appeared initially.

He was admitted again in May 1960 with a history of dyspepsia, right abdominal pain, diarrhea and decreasing regularity for the previous three and a half months. There were no features suggestive of infection, no regulation in faeces and no pathologic illness.

At this point he was passing 1.5 gms faecal bile daily each day was being more bilious. In view of his weight and his condition was progressing and admissions to hospital. The liver was just palpable. Serum bilirubin 0.1 mg per cent, alkaline phosphatase 21 K.U. units, thymol turbidity 1.0 mm sulphur 2 units, and various amylase 100 units, lipoprotease 11 per cent, $\text{Bil}\beta$ 14,000 per cent. Liver biopsy—obstructive jaundice.

He was operated upon in May, 1960 when a dilated but otherwise normal gall bladder was found with no stones. There was a stricture of the common bile duct below the level of the pancreas with the duodenum which was made clean and narrowed.

A cholangio-cholecystostomy was performed above the level of the stricture followed by a cholecysto-gastrostomy, no gallbladder, no gallstones and an enema of the body of the large bowel. A biopsy of the common bile duct stricture, was taken.

Following these procedures, the patient recovered well with complete relief of his symptoms.

In February, 1961, he reported two Brownish stools which were presumed to be solid stoolstones. He returned again in May, 1961 with sharp pains of his abdomen accompanied by a grip which subsided spontaneously or he relieved on the next nuclear exercise by increasingly frequent and distressing attacks of colic pains.

These caused his faecal casts to be composed of faecal cast of the gall bladder. The stools will appear and reabsorb.

100 patients examined had 200 stones in the common bile duct and 100 patients with gall-bladder disease, 1000 gall-bladder stones. In this series 1000 gall-bladder stones were found in 1000 patients. There was no significant difference between the two groups.

Gall-bladder stones undergo calcification (Rutter et al., 1970). At 10 years, the gall-bladder was thickened and stenosed, narrowing the hepatic portal. At the age of 10 the "White layer" was reported from the distended proximal portion of common bile duct. This process continues. The gall-bladder will be no longer useful and will regress. The distal end of the common bile duct was then caught by stretching and opening the duodenum. A stone was passed spontaneously at the last and closed the mouth of the original stricture by only 1 mm spontaneously. The region of the stricture was now dilated posteriorly but the proximal and distal portions of the common bile duct remained in its great difficulty and cholangiectasia developed over a later time.

Pan-cystic cholangiectasia showed a rapid flow into the duodenum. The biliary tree narrowed after one week and the patient made an uneventful recovery with regression of symptoms.

Since that case he has shown steady improvement in his general condition and he is free from gall-bladder complaints for some months. His serum bilirubin level has also returned to normal and is now 0.1 mg per cent. The gall-bladder has diminished mobility but more gradually and is still 100 g. It adds "Other tests of liver function are now normal."

Comments

This case appears to be a rare example of a benign stricture of the common bile duct of unknown aetiology.

The history of the stricture shows chronic inflammatory tissue with some spontaneous maturation of the lining of the common bile duct. Such maturation is seen in the chronically inflamed gall-bladder, which it was found in the gall-bladder later removed from this patient. But this is not known to occur with any frequency in the common bile duct although one must acknowledge that common bile ducts are not often submitted to histological scrutiny.

Warren Cole (1969) surveyed the anatomy of non-tumorous strictures of the common bile duct. A high percentage of cases referred to him bring the result of operative review.

- (1) Operative trauma:
 - (a) Duodenitis (thought to be spicule short)
 - (b) Ileotomy (usually with blinding vessel)
 - (c) Cystic duct ligature too close
 - (d) During gall-necrosis
- (2) Inflammation (obstruction syndrome):
 - (a) Related to cholangitis
 - (b) Abusive collection of bile about duct
 - (c) Pyelephileasis
- (3) Secondary to precipitation (usually distal segment)
- (4) Ulceration due to gall-stones

To this could be added such rare causes as parasites, foreign bodies and closed loops (Auerl, 1956).

The absence of any previous operation in the region of the biliary tract here narrows the field considerably and all the other causes cited may be

evaluated with the possible exception of a solitary, silent stone passed prior to onset of the original attack of gout.

It is possible that the many-week illness from which the patient suffered in 1882 might have been a regional state, and a similar pseudosymptomatic affection of the nervous system does not have a definite structure cannot be excluded. No gross pathological structure of the small intestine was found at operation and in the absence of positive evidence it would be unprofitable to make even a speculative diagnosis in these terms.

SOURCE:

A case of cryptogenic inflammatory structure of the common bile duct in a previously fit man of 34 years is described. The structure was usually bypassed by cholangio-enterostomy but determination of the pathobiology and eventual ablation made it necessary to resect the extramural portion of the common bile duct.

It is noted that the structure was associated with squamous metaplasia of the mucosa, resembling that of the common bile duct.

ACKNOWLEDGEMENTS:

I am most grateful to Professor Ian Aird under whose charge the patient was admitted for his encouragement in reporting this case and to Professor C. V. Harrison and the Department of Medical Anatomy for details of the pathology.

I wish also to thank the Medical Director-General of the Navy Surgeon Vice Admiral Sir Cyril May, K.B.E., C.B., M.C., F.R.C.S., Q.H.S., for permission to publish.

SUPPLEMENTS:

July 19, 1980 Correspondence to Robert Fletcher (Edinburgh, Edinburgh University) (1980) *Surgeon* 5, 111.

Editorial

S. P. FERGUSON, C. A. GILBERT, J. W. H. KELLY, and H. A. THOMPSON (Editors). *Practical Biochemistry*. Pp. vi + 1024. London: Macmillan & Co. Ltd., 1959. £5.50.

This book differs considerably from previous editions in its emphasis. There is a supply of detailed and up-to-date information on the normal ranges of values for blood, the respiratory apparatus, and alimentary organs—values that are consistently of interest. Secondly, there is rather more of a logical approach throughout the book. The physiological and pathophysiological processes, i.e. the interrelationships between the systems, are laid emphasising their interrelation. It is this that is new.

It is, of course, interesting, in the editor's preface that this book should cover the whole process of metabolism, but this has meant that a considerable amount of cross-references, and use of the index is inevitable in order to find the use of one book within reasonable limits. This is preferable, however, to the frequent references which would otherwise be necessary especially in case of the use of which the book is divided up. A more valuable, Vito Magoni's, is a complete cross-index of all the most commonly required tables, graphs, and measures.

It is particularly a work for the reader who has already had some experience of clinical biochemistry but the elementary practical methods are not described in detail. On the other hand the measurement of more specialised substances such as may be met with in the case of abnormal conditions are thoroughly described, and the advantages and disadvantages of various methods are thoroughly discussed. In this connection it is of interest to note that the detailed discussions of efficient test methods—which are rarely concerned enough for diagnostic uses purposes—have been omitted. Also it is pointed out that usual techniques might well fall into disuse—and this gives the opportunity because the test blocks are sometimes used as tests for diagnosis. To avoid this possibility only the well and standard methods of general and special analysis are described in simple and in very important points as brought out—also the wide advantage of visual over analytical methods is fully dealt with which the former can be appreciated.

Apart from straightforward questions the book covers unusual chapters on surgical shock, renal and ascitic diseases, blood coagulation and such topics as pulmonary function and the circulation of pulmonary apparatus. The work will be of service and its emphasis on physiology and pathophysiology should be a great advantage to students for the reader who has already given evidence of interest in study for the physician.

A. D.C.

BIRMINGHAM MEDICAL COLLEGE LIBRARIES. By R. G. ELLIOTT, B.A., M.D., D.H.C.P.
Consultant Pathologist, Royal Free Hospital. Pp. 182. Revised. John Wright and Sons, London.
Price 15s. 6d.

The number of B.M.C.L. books published at present is so large that the pathologist cannot be expected to query a knowledge of all of them in his field. This pocket-sized book, however, will help him to do just this. It lists all the major clinical tests handled with the normal range of values, the physiological and pathophysiological syndromes on which these values are likely to be increased or decreased and the diseases in which they may be altered.

The main object of this book, which presents the author with information about the value of bacteriological and other methods of testing, is to make available to the staff of a health board, or to any other public authority for, though the information is available to the pathology units in large teaching hospitals it has never been available to the district or health boards.

D. D. W.

Food Hygiene and Disease Risks. By Alice H. Barker M.A., M.D., M.C.B.E., F.R.C.P. Pp. viii + 35. London: H. K. Lewis and Company Limited. Price 5s. 6d. net.

No book is a book with a difference,
nor unique in fact or either
writing more than fiscal importance.
Consequently, therefore, it is
If you do not have much strong sense
about topics with any real power of value
I would rather jump over with the agrees
Obesity is what it means?
If also I enjoyed looking through it
Still, I am certainly prompted to say
that when you go down to consider it
you cannot really be reading just "Diseases."

J. H. S.

Food and Food Protection. By G. R. A. Morris M.B., B.S., L.I.C.P., M.R.C.H., D.P.H., D.L.B., D.P.A., F.R.S.H., of Greatorex, Inspector of Food, Public Health and Veterinary Services. Pp. xxviii + 550 with 175 illustrations. London: H. K. Lewis and Company Limited. Price £1. 10s. net.

This is the final edition of "Morris," which has been published in two volumes, previous editions being from one volume dealing with Meat Inspection and "Safety and Colour Tests" respectively. The whilst new book is complete and comprehensive work covering the field of Food Inspection.

Part I begins with a general section on animal anatomy and physiology with emphasis on bacteria for use, e.g. the anatomy of the lymphatic system in humans—which are of particular importance from the Inspector's point of view. A chapter on medical importance and anti-microbial measures follows, and succeeding chapters deal in great detail with the examination of different foods, defining of classes and preparation for the food hygienic inspection of meat. The later chapters of Part I discuss dysentery, other intestinal diseases, food parasitic infections, with detailed descriptions of the pathogenic organisms, and the tests required in their detection.

Part II deals with the purchase and safety foods and forms a practically valuable section of the book, including useful chapters on local vegetables and meats, canned foods, salts and various other food products which may come to the Inspector's notice. There follows a complete chapter on Industrial Food Processing, with a section for examining on materials, and the last chapter collects all the legislative provisions dealing with the safety and protection of food for human consumption.

This book is a valuable and practical addition to the present mass of comprehensive, particularly on the subject of foods other than meat. Its value should be much enhanced by increasing the number of photographs, and many of the best diagrams are rather simply and haphazardly set up to the high standard set by the late Dr. George Elliot, whose drawings, the worth will always be in the eyes of the library of a practicing Food Inspector and an otherwise valuable book for any interested hygienist.

N. E. H.

Report on West Africa. By F. C. Badger. M.D., C.M.S., 1933-1934. With maps and coloured plates. 8vo. 1936. 10s. 6d. London: H. K. Lewis and Company Limited. Price 10s. 6d.

This volume is an account of a four year survey of West Africa carried out by Professor F. C. Badger under the auspices of the Royal Geographical Society for the Royal and Foreign Medical Society and its students. After being the special biological survey carried out by the 1932 Doctor Gaddaffi Corps and his team which was published in 1936. The D.G. Report dealt shortly with the determination of rainfall stations but Professor Badger had intended to make the result of a four year survey in the optical discipline, with a view to assessing the nature and conditions of the condition, distribution and will in the area as well as a close study of *Onchocerciasis*, a chapter of note, the incidence of which is widespread, and whose economic importance has only recently become a field of widespread appreciation.

The survey at the result of four years work and is as excellent as its potentialities produce. The author's modesty need not be allowed to conceal the fact that these four years constitute a period of grinding work with hardship and danger ever present. The sum total of results in this account of an unoccupied African colony and partly a new one, exceed a few good library books.

We have so long remained east Indians with India and Pakistan with us, that present influences and political aspirations has now Africa when the lastness, the man's reason and by no means least on those who are of the need, for medical help, and skilled professional services. Only those who have had personal experience of the medical services of Asia and Africa appreciate the suffering and tortured misery of big blind and new blind as a consequence of parasitic development. The production of this volume is fine and clear and most of the photographs are of a high order of excellence.

D. P. G.

With acknowledgment, with thanks, for the following publications:

- West African Medical Acte. African Health Services Act. The Parasite Dr. Medicine. Mass cult. Agents of Tropical Diseases and Parasitoses. Annual of African Health. Tropics. African Medicine Institute. French Army Medical Bulletin. British Medical Journal. Army Hospital Quarterly. Journal of the Royal Army Medical Corps. Journal of the Royal Naval Medical Service. Medical Officer. African Journal of Tropical. Weekly Journal of Central Diseases. African Veterinary Bulletin. South African Hospital Journal. The Medical Journal. African Medicine. Medical Myths of Africa. African Journal of Medical Research. Pathological Research. Proceedings of the Royal Society of the Arts. The Royal Society of Medicine. Royal Anthropological Soc. Review. On the African Affairs of China. Dr. Alan's Hospital Course. Dr. Thomas' Hospital Course. Dr. Thomas' Unsped Report 1936-37. The African Journal of Experimental Biology and Medical Science. The African. The African Physician. The British Journal of Surgery. The Journal of the Royal Medical Committee. The Irish Journal of Medical Science. The Lancet. Annual. The Lancet Medical Journal. The Medical Post. The Medical Record. Mid. Report. The Indian Journal of Experimental Medicine. Progress of Doctor. Indian Institute of Science. Medical Geog. U.K. Annual. Proc. Medical Journal. World Health Organization. Disease. Parasitosis. Medicine. Insects.

Officers of the Service

ADMIRALS

Sir George Edmundson W. H. EDGAR, C.B., D.S.O., died suddenly at Akarai's, Maro, Tonga on 2nd November 1939 at the age of 74. He served the Royal Naval Medical Service as a Surgeon Lieutenant in May 1886, Promoted Surgeon Lieutenant Commander in November 1893, Surgeon Commander in November 1898, Surgeon Captain in December 1902 and Surgeon Rear Admiral in January 1919. He was placed in the Royal Navy on September 1923 and reappointed until he received in the Royal Navy on 1st March 1938. He died December 1939.

Torpedo Boat Admiral Edgar was awarded the Q.D.C. in January 1900 and the C.A.F. 1st Class in 1904. On the 1st January 1912 he was appointed Honorary Physician to H.M. The King.

C.B. D.S.O. service.

R. H. Edgar was Surgeon Q.M.R. when our beach party landed in 1914. In those days the gallant behaviour of a gallant Captain and a gallant Lieutenant was in many respects much safer than it is today—the Surgeon Captain Edgar was a gallant. His heroic acts were due to the young doctor's valiant courage and the delighted atmosphere of their comradeship was something quite unforgettable. It was his good fortune to serve under Surgeon Rear Admiral Edgar from 1909 until 1911 who he was in charge of R.M. Hospital Aden. These very difficult days during which the hospital was situated in frequent raids by the Turks last also more than longer days. The Surgeon R.M. Hospital and his charming wife maintained their usual cheery optimism of the difficulties presented. The Admiral was the most approachable of men and was always interested the interests of all subjects professional or personal. When one had finished something, usually in R.M. dress or other other way in social functions, every time he is in full white and then made a salute with a sword bay. Through his poor shortcomings—now let us look at the credits side! The result would naturally in a considerable pair of trousers which would not have disgraced a leading partner. He had that same approachable virtue of being liked to his peers at all costs. One later time when they said that he would receive his orders, which unfortunately and consequently they largely was he at all up to the norms degree. He married his own size of maturing dreams. At the Memorial Service in Madras when it was revealed that Harold Edgar had displayed the pair of Madras Jockey Club breeches he still is in evidence. He could not distinguish for colour with the efficiency by dismounting of himself without the support of his life partner, one Miss Mrs. Mabel with tears. It is a great pleasure to have learned these facts.

Surgeon Commander B. W. MACLINTOCK, R.N.

An inconspicuous commanding officer

His memory remains in the Service, will long be a main and witness of the tragic circumstances of the death of Surgeon Commander B. W. MacLinton. Edgar MacLinton was originally a collected personality and this was influenced by the regularity and rhythm on which he was held by the Ships company, for whom, indeed was he not born responsible during his Service career.

The curriculum of King George was widely known throughout the Services and especially in a period of absence. Many officers and ratings will have cause to remember his professional skill and the many acts of heroism along the normal course of duty for which he was responsible and will wish to offer their congratulations to his widow and family.

Colonel L. M. Macmillan, *JAMES THOMAS STIMPSON*, *M.A., F.R.C.S., F.R.C.P.* (F.R.C.P. 1910), who was one of the first seven practitioners to commence clinical practice at the end of '10.

He passed the R.M.C.B. in 1912 and going loyal and enthusiastic served his country well.

During the War he was one of the gangrene of modern medical practice and did much original work in the physiological and pathological problems of tetanus. He was *President of Council for Medical Theory and Practice* at the time of his sudden death. He also served as *Medical Superintendent* at R.H. Aspinwall Hospital at Liverpool.

H. E. B. C. (contd.)

Sergeant Carpenter was at Hove for his convalescence when I first joined the Royal Navy and the foundations of a lifelong friendship were laid. Memories of those very happy summer days always coupled with those of Jimmy's happy and kindly personality. I can sincerely remember him playing regular tennis (though both a tennis player and a footballer with the L. Division system) and holding all the age well surpassing a most brilliant career from birth to date.

During the War his courage and eloquence gave much hope from him that the best and most of a first-class physician. One could not be in his cheerful and optimistic company without feeling the benefit of it. He leaves his growing and valued son for memory.

PROMOTIONS AND AWARDS

Commissioner of the Royal Household: Duke of the York

Sergeant Major Animal D-30 Section Q-H-A Q-H-P L-R-C P-A-S
Sergeant Major Admin C-129 C. P. Surgeon Q-H-S L-R-S

Officer of the Most Excellent Order of the British Empire
Sergeant Carpenter J. Goss L-R-T P-A-S D-P-H R-N

HIGHEST DECORATION

D.C.P.—*Sergeant Commander F. W. Robertson*.
D.F.M.—*Sgt. Major—Sergeant Lieutenant-Commander F. J. Purser*.
D.G.M.—*C.O.C.—Sergeant Lieutenant M. Wicksforth*.
D.A.—*Sergeant Lieutenant D. B. Langford*.

PROMOTIONS

To Sergeant Captain in *National Director General of the Navy*—Mr. R. S. Parry-Jones.
D.H.T. (1914-1919)

The following personnel relatives have been promoted to position in the Royal Naval Fleet:

To Sergeant Captain—R. Miles W. Wilson
To Sergeant Commander—G. D. Dingley D. R. Whistler
To Sergeant Captain (D-30)—H. M. Evans D. J. Goodship
To Sergeant Commander (D-3)—E. F. Rogers

ROYAL NAVAL RESERVE

(To date 1st December 1919)

To Sergeant Captain—A. E. Radford
To Sergeant Commander—A. G. B. Gervase D. J. A. Evans C. De P. Head
To Sergeant Captain (D-3)—J. S. B. Sambrook
To Sergeant Commander (D-3)—J. G. A. Pigott M. Rowson

NOTICES FOR SHORT SERVICE COMMISSIONS

B. J. A. Anderson M.R.C.S. L.R.C.P. D.A.C.O.G. F.R.M.R. House M.D.
 C.H.M. F.Q. Collier M.R.C.S. L.R.C.P. M.R.C.O. J. M. Linton M.R.C.S.
 M.R.C.O. L.R.C.P. G. Massey M.R.C.S. L.R.C.P. J. G. Miller M.R.C.S. L.R.C.P. E. H.
 McEvoy M.R.C.S. L.R.C.P. M.R.C.O. R.A.C.F. R. L. Owen M.R.C.S. L.R.C.P. J. S. Povey
 M.R.C.S. L.R.C.P. I. C. Richardson M.R.C.S. L.R.C.P. D. J. Shattock M.R.C.S.
 L.R.C.P.

WARDMASTER OFFICERS

PROMOTION

To Wardenor R.A. Lawrence—S.E. P.O. C. Weston

NURSEMENT

Wardenor Lieutenant-Colonel A. E. Mason
 Wardenor Lawrence T. Morris

QUEEN'S ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

HONOURS AND AWARDS

British Army Medical Military Service
 Miss Louise Margaret Parry Head N.A.D. Nursing Sister

Director of the Royal Red Cross, Second Class

Miss F. F. Paterson Registered Nurse
 Miss A. Bay Head N.A.D. Nursing Sister

NOTICES FOR SHORT SERVICE COMMISSIONS

Mrs. S. Burton F.R.M.R.

TRANSFERS TO SHORT SERVICE COMMISSION

Mrs. E. A. Lawrence Senior Nursing Sister

On the evening of Monday 8th February 1960 members of the Portsmouth and West Sussex Branch of the Institute of Medical Laboratory Technology were entertained at the Royal Naval Hospital School.

The opening address by the Medical Officer in Charge was followed by a lecture by Captain Commander S. Miller R.N. on *Cancer Problems in Tropical Medicine*. This was very clear and there was also a lecture on decompression of tropical patients.

The meeting ended with supper which was greatly appreciated and which was organized by Wardenor Lawrence and Mrs. F. M. Nichols.

**ARMED FORCES MEDICAL SERVICE
ANNUAL REPORT, 1959**

Balance Sheet

Assets	£	s	d	Liabilities	£	s	d
Medals 111 1st 3rd Class	250	4	2	1959 Salaries & wages £1000	100	0	0
Cash	1	18	0	Interest	10	0	0
Value of 1st, 2nd Class	200	15	0	Postage etc.	20	15	0
Value of 1st, Travelling Books	10	10	0	Stationery	10	10	0
Deposits Available	200	0	0	Accrued interest (postage etc.)	200	0	0
Advertisement Charges not yet paid at					600	0	0
Spring 1959	0	0	0				
Summer, 1959	10	10	0				
Autumn 1959	0	10	0	Balance Current	400	10	0
£1 600 10 0					£1 600 10 0		
Capital and Fixed Assets				Signed R. G. Lacy			
				Supply Lieutenant (W) R. S.			

ADMIRALTY FLIGHT ORDERS—1940 AND 1940

(See page or pages indicated for full details)

1940

- 2770—Medical—Cost of Nursing—Provision from High Recovery Fund
- 2828—Medical—Nursing—Reissue of Admirex Form M 145
- 2840—Hospitals and R. N. Medical Establishments—Scale of Charges for Treatment
- 2894—Medical (Normal and Hospital) Disbursements
- 2977—Medical Stores—R. N. Blood Transfusion Units.
- 3020—Admiralty, Surgeons and Agents—Appointments. (Form S 502)
- 3111—Carron—Medical Officers—Carried in Medical Report of Carronade Frigates and Carried in List in 1940
- 3680—Medical—Commissaries—Personnel Appointed to Posts in the Allied Countries. (Decr)—Admiralty Commissariat and Department of Commissaries

1940

- 25—Medical—Disclosure of Service, Medical Records in Present Units in Service
- 26—Medical—R. N. Bulletin No. 19—Distribution
- 27—Q. A. B. W. M. 1—Naval Nursing Service System—Instruction
- 28—Naval Stores—Medical and Dental Stores—First Supply Escort Measures. Policy S.111 1940—Observation
- 29—Serial Sheets/Plan of Port, Baltic D.—Instructions
- 319—Medical—Night—Squadrons—Supply Report and Dispensary in R. N., R. M. and R. E. N. (Revised) Home and Naval Admiralty Squadrons and Ships and Function of Naval and Admiralty Circular Personnel (Admiral)—Arrangements.
- 321—Medical—Squadrons—Carrying Models 12 and 13A—Supply to Areas

Editor

The Editor invites original papers or brief notes on subjects related personal experience, etc., from all over the world. All types of groups will be welcomed from single and small clinics up to large and George hospitals. Notes of books, messages and charts are invited from all quarters.

All articles or communications intended for the Review or the Royal Naval Medical Service will receive the priority of the Journal with full opportunity given, under the editor's direction, of leading to the article that he deems to deserve the highest or lowest.

The Harvard system should be employed for bibliographical references; these references, arranged in alphabetical order of the author's name at the end of the contribution, are: Smith T. G. (1925) J. Am. med. Ass. 104, 11. In the case of a reference which is cited by giving the author and in addition the date, this (1925) is taken also to be true, etc.

The Journal is published quarterly four numbers comprising one volume.

Articles and communications may be sent to the Editor at any time. They should be clearly written in, preferably, typed and sent to the Editor, R.N. Medical School, Aldershot, Hants.

Subscription

For R.M. and R.N.V.R. medical personnel on the active or retired list, and the Commissaries of the Royal Navy, the subscription is £10 per annum (postage included) payable in full in January of each year. Single copies 2s.

For naval officers in the above categories, the subscription is £10 per annum (postage included) or £1 per single copy.

For all others who are not in the above categories the subscription is £10 per annum (postage included) or £1 per single copy.

Cheques and postal orders should be crossed "Lloyd's Bank Ltd." and made payable to the Editor, "The Journal of the R.N. Medical Service".

The payment of value placed by banks is under no circumstances to be taken as the valuation of the service of forwarding a cheque, cash, post and postage for keeping of records.

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THE EDITOR.

Journal of the Royal Naval Medical Service,
R.N. Medical School, Aldershot, Hants.



Journal of the Royal Naval Medical Service

PUBLISHED QUARTERLY

(The Admiralty do not accept responsibility for the opinions expressed in this Journal)

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Edited by

THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL,
ALVERSTON, HAMPSHIRE.



Surgeon Lieutenant Colonel W. H. PENDERIDGE, C.B., Q.M.C.

Editorial

The Medical Branch of the Navy will view the retirement of Surgeon Vice-Admiral Sir Cyril May with regret, though the regret will be offset by the realisation that a four-year term of strenuous service, coming towards the end of a long and distinguished career, comes not and relief from the burdens of high office. The departure of Admiral May brings with it the end of yet another era. Because he was the last surviving Naval Medical Officer to have served in the First World War, whose gallantry was recognised by the award of the Military Cross.

Those of us who are old enough to now remember characteristics displayed by the various Medical Directors-General under whom we have served, are capable of assessing the shortcomings of each. In the natural course of things, the respective qualities of our Directors are legitimate subjects of informed discussion and free comment. We frequently remark that 'X' was a better Director than 'Y' but that possibly 'Z' was better than either of them. At the same time in speaking only of the merits of the qualifications of each Director because their lack of capability is something which has never arisen.

The office of Medical Director General of the Navy is one which calls for a multifarious array of attributes. Apart from his long, proven experience and proved professional ability the holder must be a discerning and patient administrator of the highest order. His position is no sinecure; his burdens are never light. He must make swift and far-reaching decisions, carefully balancing at the scale the pros and cons of situations which are constantly changing in the light of modern developments. He must accept the things which cannot be changed. He must have the courage to change the things which ought to be changed. Above all, he must possess the wisdom to distinguish between the unchangeable and the changeable. He must be a master of the art of diplomacy. He must control the continuance of a system whereby medical obligations may be harmoniously co-ordinated with Naval Discipline, so that Doctors and Dental Surgeons may perform their duties without embarrassment. He may well have to solve great problems of personnel and supplies in the most brief and the shortest time. He provides some form of political petitionary or, perhaps, traces the tedious and tortuous intricacies of the latest liaison of the Treasury. The essence of his life is a selfless service, dedicated to that task which is of paramount importance to the Nation, the preservation of the Health of the Navy.

The complex combination of qualities is not easy to find in a single individual. But this the combination is always forthcoming speaks well for the Medical Branch of the Navy. The necessary requirements were originally devised by James Lind, Robertson, Thomas Trotter and Gilbert Blane in the eighteenth and early nineteenth centuries. In our own day they have been developed by Gaskell, Dred Hall, Nicholls, Sheldon, Chukley, Gossage, Ingilby-Mackellar and lately by Cyril May such as different from the others, but each stamped with the quality of greatness.

We shall greatly miss Sir Cyril May and we wish him and Lady May many years of health and happiness in well-earned retirement.

In the person of Surgeon Vice-Admiral W. R. S. Penderidge whose photograph we are privileged to publish, a worthy successor has again been found so that the Medical Branch may continue to view the future with confidence and in the full knowledge that no welfare has been placed in capable hands. We wish Admiral Penderidge that success during his term of office which we are certain will be great.

Studies

PERSONNEL RESEARCH

III

Sergeant Captain J. P. KELLY, R.N.

The intention in this paper is to outline what is meant by the branch of naval medical research which at present is designated "personnel research" and to review the various fields of interest which have been explored in the last eighteen years; the organization for doing personnel research and the part to be played by naval medical officers.

The Royal Naval Scientific Service is responsible for research to provide information which is necessary in the development of naval weapons, detection and communication systems, propulsion and auxiliary machinery and the construction of ships where it cannot be obtained from existing sources. The Scientific Service is not responsible for naval medical research. This falls within the province of the Medical Director General of the Navy. The Scientific Service does, however, provide financial support for medical research of particular naval relevance which is not being carried out elsewhere, and for the establishment of special laboratories or research groups for studying problems which cannot be handled conveniently in other ways, for example, underwater physiology at the Royal Naval Physiological Laboratory or the effects of hot climates on men which was investigated in a Tropical Research Unit in Singapore from 1941 to 1945.

The purpose of the Royal Naval Medical Service is primarily the treatment of the sick and wounded and the practice of preventive medicine. Such conventional medical research as may be done is usually part time and stems largely from individual interests and enthusiasm. Professional and civilian societies are formed accordingly. There are five full-time research workers, but many have research interests. It is expected that the results of conventional medical research in universities, hospitals and medical and industrial research institutes will be applied in the Navy as they are in the National Health Service and University Departments through the initiative of the individual medical officer, the medical and scientific journals he reads, the learned societies to which he belongs, post-graduate education, consultant services and, occasionally through the medium of special committees where

these are necessary. It is essentially a personal responsibility for the individual to ensure that he is fit and ready, professionally competent, and up to date.

This does not however complete the picture. The need for equipment and the requirements of naval operations impose conditions on personnel which sometimes will exceed the experience of conventional medical practice or show which the ship-side expert cannot be expected to appreciate in their full importance, let alone though he may be, and which he has at times been known to prefer to ignore. Thus when Scutari was rampant in the Fleet in 1923, even Sydenham remarked that "the two great maladies of naval and naval physicians were miasma and the scourge which they blamed for disorders and symptoms often owing to their own inexperience." He had not been on a long sea voyage, and it was more than a hundred years before the weapons and physician overcome such hidebound practice where such detailed study of the reforms which were necessary to preserve the health of men.

When this has been said, however, it must be admitted that during the last two centuries there has been a rich collaboration of ideas between the naval medical departments and the medical officers and those who have concerned themselves with exploring and solving the fundamental requirements for satisfactory navigation and service. In the twentieth century the fruitful association has expanded to embrace a joint consideration of the complex environments of the submarine sailor: the deep sea and shallow water dives and the naval reactor, an ever-expanding range of widely diverse environmental extremes associated by the industrial hypothesis, and those hazards associated with atomic biological and radiological defence.

Until relatively recent years there was no formal machinery to enable the Admiralty to call on outside medical scientific advice, other than the channels referred to above which are available to the profession as a whole. From time to time committees with outside experts serving on them were set up to deal with special problems, such as the Admiralty Venereal Committee of 1914 and 1927 or the Physiological Subcommittee of the Admiralty Between-the-Wars Committee in 1926, but there was a lack of continuity about the temporary committee procedure which was unsatisfactory for dealing with a complex of circumstances which were forever changing, with operational requirements and new developments in weapons and weapon systems. It is of value to review briefly how it changed in the case of others some detail.

In 1900 the Medical Research Committee, established in 1903 to administer funds set aside for research by the National Health Insurance Act of 1901, became the Medical Research Council of the Committee of Privy Council for Medical Research. In those days the Lord President of the Council was the Minister directly responsible for the conduct of war affairs. Today the Minister of Science, the Lord Privy Seal, is the responsible Minister and the Council is not responsible to the Privy Council. During the formative years, between the two World Wars, it is not surprising that the Council was little occupied with problems of military medicine. For instance after the "war to end

Service" as the popular slogan in the mouth of most people. A study of colour vision requirements in the Royal Navy was undertaken, however, and the results were published in 1918, and throughout that period the "Cotton's Industrial Fatigue Research Board" which developed in 1913 from the Health of Miners and Workers' Committee established in 1912, and which was later succeeded by the Industrial Health Research Board, collected accurate specific data on problems of industrial physiology and psychology much of which was to prove directly relevant later to the requirements of the Services.

By 1919 it was apparent that war was imminent and that the pattern of the British medical research effort required to be modified and expanded to meet the emergency. It was logical with the great demands, speeds and accelerations which were being imposed by the new designs of lighter aircraft coming into service, that attention focused first on the needs of the service in the air and the Secretary of State for Air appointed a Flying Personnel Research Committee to advise on "the medical aspects of all matters affecting Royal Air Force personnel, which might concern the safety and efficiency in flying including research into problems associated with the scientific selection of flying personnel and into measures designed to maintain their physiological efficiency." It is significant that the first Chairman and the Chairman throughout World War II, was the late Sir Edward Mellish, the Secretary of the Medical Research Council, and the Scientific Members include several members of the Council, but it was, and still is, a Committee of the Air Ministry not a Committee appointed by the Medical Research Council. This committee is now responsible for advising not only the Royal Air Force, but also the Admiralty and the Ministry of Civil Aviation where the needs of the aircraft in the air are concerned. The Medical Director-General of the Navy is represented on the Committee and naval medical officers and psychologists work as unpaid members of the staff of the Air Ministry's Institute of Aviation Medicine where research on these problems is carried on England today.

In 1918, following the evacuation of the British Expeditionary Force from Dunkirk, the Army Council invited the Medical Research Council to establish a Body Protection Committee, on which representatives of the General Staff and the Royal Army Medical Corps worked with civilian experts to advise on body, eye and hand protection, and in 1941 the Committee was strengthened and became the Military Personnel Research Committee. Unlike the Flying Personnel Research Committee this Committee sits, like its predecessor—the recently re-constituted Army Personnel Research Committee—a Committee appointed by the Council not by the Service Ministry. Its interests now and still are, related primarily to "developing ways and means of ensuring the maximum safety, efficiency and comfort of the healthy soldier in the service," not with the care and treatment of the sick and wounded.

When there were mutual interests the Admiralty participated actively in the affairs of both these personnel research committees, notably when these concerned the prevention of motion sickness, the use of narcotics, visual

problems, and of course, flying personnel requirements, and for a time there did not appear to be too pressing a need for the establishment of a separate committee to consider naval problems.

However, in August, 1941, Sir Edward McIndoe had written to the Board of Admiralty offering the assistance of the Council's organization and medical staff in the event of war, and the Medical Director-General was represented throughout the war by numerous members of the Council which considered the treatment of war wounds, battle injuries, nerve injuries, traumatic shock, malaria, typhus, pneumonia, transfusion methods and the care of disperced personnel. The last-named of these committees—the Committee on the Care of Dispersed Personnel—published a Memorandum in 1943 which became the voluminous for the potential dispersed service enjoyed a wider circulation than any other of the Council's war memoranda. The Medical Director-General of the Navy at that time, Captain Vice-Admiral Sir Shelton Drury, was its Chairman and as the Committee concluded its consideration of the problems before it in 1942, the Admiralty invited the Council to set up a Royal Naval Personnel Research Committee.

The Committee first met on 17th November, 1942. Sir Edward McIndoe was the Chairman and Dr G. L. Bates was appointed Secretary. It has functioned continuously since that time. Dr Brown (now Professor Sir Leslie Brown) succeeded Sir Edward as Chairman when the latter retired in 1948. Apart from the civilian scientific members of the Committee, the Admiralty is represented by the Medical Director-General of the Navy and one other naval medical officer, the Deputy Controller (Research and Development), the Senior Physiologist, and the Assistant Director of Tactics and Weapons Policy who represents the Naval Staff and on behalf of the Admiralty represents two, as the business of the Committee requires. The council appoints a Secretary and Assistant Secretary from its Headquarters' Staff.

The terms of reference of the Committee, revised at the sixth meeting on 20th March, 1943, are to advise the Medical Research Council "on such investigations as the Council may be asked to undertake (by the Admiralty) on biological, medical and psychological problems affecting the health and fighting efficiency of naval personnel; and to suggest investigations with a view to improving or repairing the health, fighting fitness and effectiveness of naval personnel, and to aid and supervise such investigations as expedient." In practice, like the Army Committee and somewhat contrary to the terms of reference, the Committee has confined its activities largely to the physiological and psychological problems and ready suggests ones which already concern adequately by other medical committees or organisations, or by the various Service medical departments. There is still the policy although the way is obviously clear for the Committee to expand its interests in any direction it wishes if the need should arise.

The term "personnel research" occurs in organ very largely to its use in the titles of three other committees and in England, where it is used in a medical context, it generally refers to activities such as the over work which those

communications have been concerned. Elsewhere it may be interpreted differently. In South Africa personnel research is primarily the concern of non-medical psychologists and the field covered is in some ways more restricted. Conversely it could easily be interpreted more comprehensively than it is in Britain today. It is no exaggeration to say that there is much to be gained from the naval viewpoint by dropping the *slang* and simply referring to "medical research" and the Medical Research Council's "Naval Naval Committee" for in practice most new problems on which the Council's advice is required in the Admiralty are referred in the first place by the Medical Director General of the Navy to the Secretary of the R.N.P.R.C., who nowadays has an office in the Admiralty to handle the very considerable day-to-day administrative affairs of the Committee, and "medical" research does after all include the interpretation of the problems of the fit as well as the unfit. However, for the time being we shall continue to talk of "personnel research", but it is important to note that the Navy's medical interests have become so closely linked with those of the Medical Research Council (when there is a common ground), that it is incorrect to regard the R.N.P.R.C. purely as a committee with physiological and psychological interests, although it is true that up to the present these have been predominant in its transactions.

When problems are referred to the R.N.P.R.C. Secretary which fall outside the immediate purview of any of its working Subcommittees or panels, they are usually be passed on to one or other of the Council's numerous committees, referred directly to one or more of its many expert advisers, research units, groups or other associated organizations, or if a long-term commitment is foreseen, a new subcommittee may be formed or a new unit may be set up to study a particular problem or series of problems.

It is probably true to say that personnel research has still to find its proper level and identity. It may be that the present rate of effort is boosted somewhat artificially by the circumstances of the cold war years which we hope we may be allowed to leave behind us. Or it may be, and this is more likely, that more accurate thought, effort and money will have to be expended on the study of the human and environmental factors which are important to the efficiency, health and morale of naval personnel and therefore to the Navy as a whole.

Personnel Research in the Navy 1940-1950

After the formation of the R.N.P.R.C. in 1942 the first investigation was to study conditions in the first major unit of the Coastal Fleet. Command Representatives visited various bases in the United Kingdom to identify problem areas; a physiologist was appointed to the Directorate of Coastal Forces Material and during the remainder of the war maps were taken in detail with each feature in certain measure possessing extensive nasal ventilation and reduction of condensation, and the design of steel bunks and body armour which could be quickly discarded in emergency. Changes to trains engaged the attention of the Committee at the outset of its deliberations, and an answer

was sent with a Northern Convoy on the Massmark run in winter to report on the various situations in which he thought the Committee might help. The efficacy of this cover approach and the value of his report to the Naval Staff was such that he was sent to make similar observations in the Mediterranean, Indian Ocean and South Atlantic, a wide survey which was followed by the appointment of a "Torpedoine Subcommittee" (later called the "Hydrography" and then the "Climate, Efficiency Subcommittee") and the despatch of the Hydrography Mission to the Eastern Fleet and British Pacific Fleet in 1944. In this way detailed observations on the movement between decks were made and the end of the war as part of a broader programme to which reference will be made later.

Another early concern of the Committee was in underwater physiology. Amongst one of the functions of the Admiralty Committee on Submarine Escape which was convened following the pre-war loss of H.M.S. *Sabre* was Diver's physiological experiments, now undertaken to study, inter alia, the effects of high initial pressures of oxygen and carbon dioxide, which served more to show the magnitude of the problem rather than its solution. By the middle of the war however, the operational importance of these two factors came dimly to the fore with developments in underwater warfare, "Tapa Soot" at that time, which led eventually to the "torpedo hospital" propelled by a diver using self-contained breathing apparatus and K Craft, midship submersibles from which it was possible for divers to operate in moving anchorage. Two other aspects of the type of operation which were investigated were the effects of rapid changes in pressure in divers' tanks on decompression or surfacing too rapidly, and the effects of pressure waves from exploding depth or demolition charges on men under water in which information was needed to protect bridge parties and others. A Subcommittee on Underwater physiology with Dr. Isaac in the Chair was appointed early in 1943 to advise on such matters and naturally included within its terms of reference the problems of submarine atmosphere and of deep diving carriage systems and integral habitat formation on surface too rapidly (the "Beds"). For obvious reasons very few knew of the activities of this group during the war, but they became one of the most active and productive of the wartime Subcommittees (amongst at least two or three in the post). The Royal Naval Physiological Laboratory was established on the recommendation of the R.N.P.R.C. and worked in close collaboration with groups at the National Institute for Medical Research and the Admiralty Experimental Diving Unit and with the medical officers attached to the operational teams in theatre.

A most important though over-looked important group of problems also arose in the provision of aerial gearetry, concerned with the anatomical relationships involved in the design of divers and air locks and tightness in relation to seating and manual and pedal-operated controls. Associated with these were various difficulties in helmet and clothing design. A Gentry Subcommittee and a Clothing Subcommittee was formed to handle these problems and the former at an early date intended its references to include

investigations of the effects of muscle strain and gas layer conditions where condensation in the Arctic and excessive heat in the tropics increased the heat stress. In gas layer layer quarters not only did heat factors but the need for economy in the energy cost of pumping the very heavy nuclear charges and projectiles upon which the rate of the deposit in the enclosed and unventilated heating rooms, messrooms and shell rooms also imposed a series of interrelated physiological stresses which occupied the time of several groups of investigations until well after the end of the war.

There was another wartime Subcommittee which only met a few times to discuss the problems of anti-aircraft. These were primarily concerned with selection and training of operators, the resistance of anti-aircraft and how such the design and layout of controls and displays. These activities were transferred to the Chemistry Subcommittee when the latter changed its name and its name of reference and became the "Operational Efficiency Subcommittee" some time after the war ended.

These groups were responsible for most of the wartime studies sponsored by the R.N.F.R.C. The climate habitation investigations included the examination in controlled climate chambers, located in the National Hospital Queen Square, London, and in the Medical Research Council's Applied Physiology Research Unit at Cambridge of the physiological and psychological effects of work at high temperatures with the objective of obtaining factual evidence concerning the effects of the climate extremes on efficiency. There were eventually pilot studies designed to develop what "artificially acclimated" naval ratings as subjects, techniques which could be employed in a tropical laboratory to examine the effects of working under excessively warm conditions on "tropically acclimated" men. The emphasis on this aspect of the Committee's work was considerable for there was very real uncertainty concerning the possible nature of the "human factor" of its recommendations as only partially implemented Fleet had to fight a prolonged action against the Japanese in the tropics particularly in the light of the earlier decisions in the Java Sea and off the coast of Malaya when H.M.S. Prince of Wales and H.M.S. Repulse were sunk, and at that time many envisaged the Naval War would continue at least until 1947. Professor H. C. Stans, an Englishman who was the Professor of Physiology at the University of Pennsylvania and a world authority on the physiology of work at high temperatures and Surgeon Captain Macdonald L. Mackay Consulting Scientist and Chairman of the Habitation Subcommittee explored possible uses for a tropical laboratory in the Eastern Theatre of Operations and selected a laboratory at Bombay which the Government of India agreed to make available.

As a result of this year's work many practical suggestions were made, which materially improved the working conditions in the Fleet and indicated what the main weaknesses lay in the way the men were concerned. A notable development by the Chemistry Subcommittee was the "Block-up". This comprising no material, a physiological and a psychological, which went to an the "locked-up" models of new weapons or other equipment before the

design was tested, in company with the users, designers and research department representatives. They were able to influence the design of a number of pieces of naval hardware to enable them to be operated more effectively by the average man, which were in use before the war ended; one of the weapons improved in this way being a naval gun-barrel gun, the overall performance of which was greatly improved by simple modifications which could not, however, have been incorporated in a later stage of development. This approach, which has lasted surprisingly well, was a departure of the type mentioned above at much less frequent intervals, had much to commend it, and although it could not be described as research, at that stage of the war its results were almost certainly of more practical value to the Navy than some of the more systematic and basic studies or laboratories and more than justified the *ad hoc* decisions in this way of the distinguished scientists who were members of the Panel.

In the early part of the year the Royal Naval Physiological Laboratory dropped most of its physiological work to concentrate on the biophysical problem of providing divers on the beach demolition teams and harbour defence parties with protection against the underwater effects of their own charges or of the enemy's bombs cast as depth charges during the invasion of Europe, attack took place in the spring.

The war ended earlier than had been expected in early 1945, and some portion of that was apparent soon after the New Year, 1944, opened. It became likely that the results of the more systematic and time-consuming laboratory research would not be applied until after the war ended. This caused some consternation of the Committee's chair which formerly focused on the type of project which would help to win the war, now embraced the need to develop the research programme so that the more basic needs of the Navy for the type of assistance which the Medical Research Council could provide would be met, not only for the remainder of the war but in the years that came after.

The "Borneo" project was abandoned early in the year on the advice of the Supreme Allied Commander, South East Asia, who urged that the Committee should wait until Singapore lying on the Equator was occupied. This advice, which was accepted, caused little to the establishment of the Royal Naval Tropical Research Unit at Singapore, but experimental work did not re-commence there until the latter months of 1948, and the remainder of 1949 was devoted largely to a continuation and expansion of the activities outlined above. The domestic publications of the Reports of the Hydrobiology Branch and the Pacific Fleet Unit, an typhoon study to determine the seasonal control of the use of a carrier and of submarine under operational conditions, and the use of a number of hydrobiological cruises in new types of waters.

Any account of wartime postoced research in the Navy would be incomplete without a further brief reference to the Clothing Subcommittee mentioned above and the Food Problems Committee. The former Subcommittee was

were added to those already on the existing pattern of breeches and gaiters, but on the problem of body protection it concentrated, including protection against bush and lame, low velocity projectiles, incendiary and extreme cold which led to the design of new types of sea-duty gear, body armour, immersion clothing and a wide range of cold weather items fit test at Admiring Room services.

Until the Visual Problems Subcommittee was established the Admiralty relied on the Visual Subcommittee of the Flying Personnel Research Committee for advice. A number of peculiarly naval problems arose however such as the visibility of submerged submarines and of ships alongside under crowded circumstances. In fact type of gun played the various naval uses the most notable puzzle. For pilots landing on a carrier flight deck onto the sun the visual aspects of aerial manoeuvring and so on which called for something more. The Subcommittee collaborated with the Admiralty Research Laboratory in an attempt to develop satisfactory sets of flight visors and conducted an investigation to determine the most suitable method for testing colour vision in the Navy. The former probably provided the most significant contribution. The Medical Research Council's Colour Vision Committee (1938) mentioned above had passed on certain details on the then current method of using the Ishihara Colour Test. The labored did not lead itself to the necessary modifications however and the Subcommittee were able to show that when it was compared with the more strictly standardized Marlow Lanthorn, using the ability of the subjects to read Ishihara colour forms as the criterion the Marlow Lanthorn was the more efficient at weeding out those with defective colour vision. The Marlow Lanthorn was therefore recommended for use in the Navy and subsequently adopted.

When the end of the war came the position came under critical review. The Board of Admiralty and the Council were both in favour of continuing the work which had been commenced under the Committee's aegis in the post-war period. Formal approval was obtained from the Treasury for the financial support by the Admiralty where necessary of research carried out by the Technical Research Committee in University and other non-university research establishments. Many of those who had been responsible for the wartime investigations both at and out of uniform returned to their previous occupations but surprisingly enough the level of activity did not flag off. On the contrary some expansion was to be seen in the establishment of a Submarine-Surface Subcommittee in 1946 to study the problems of armament at the surface, i.e. an Underwater Mine Subcommittee in 1947 to examine the phenomena responsible for ignition in devices of surface minesmen by underwater explosions and the two ways of protecting personnel against this type of injury and a Subcommittee to study problems in the Women's Royal Naval Service. The latter was never established and has now been wound up, but the other two have both made outstanding contributions in the post-war years. A number of visits to Germany, France and Italy were also made in the second months of the war and early post-war years by observers to deal with

what progress in personal research had been made in Europe during the war.

In 1949 saw the resumption of the tropical studies at Singapore where they were continued for the next five years, and after lengthy discussions with Canada and the United States in Toronto in July the Dispatch of a survey task force to northern waters in the winter months with a young team of naval and civilian scientists to observe the effects of very cold operating conditions.

It was inevitable however that there would eventually be some slowing of the tempo with the departure of most of the wartime investigators and their replacements by others who were new to the work, who lacked the stimulus of the wartime Navy and its urgent problems. Consequently began to meet twice a year instead of twice a month, some of them did not meet even that often and others became completely inactive. Research is not self-renewing, it can only thrive on new problems and new ideas and these were far a time not readily forthcoming.

The outstanding activities of the post-war years have been those which stemmed from the deliberations of two Admiralty Committees, one dealing with the problem of escape from under water immersion and one with aerial life saving equipment and training, which were convened shortly after the war ended. A series of trials ensued in the first submerging submarine, an extensive series of physiological and psychological studies on the effects of work at high temperatures at Singapore, the establishment of a Royal Naval Unit at Cambridge to support the work of the Medical Research Council's Applied Physiology Research Unit and Unit for Research in Experimental Medicine on a semi-government basis, a series of experiments and tests carried out from the Royal Naval Physiological Laboratory to amplify what was already known about the phenomena of underwater heat and how to protect against them, and the establishment of still another Subcommittee, this time to advise on heating conservation and protection against high intensity sun.

As a result of the first of these the Admiralty Standing Committee on Submarine Escape was formed. The Board method of buoyant ascent without the use of any breathing apparatus was evolved and the 600-foot escape training tower in H.M.S. *Sophie* was built. All the present physiological research associated with the approach to a simple problem was carried out by the Royal Naval Physiological Laboratory and Royal Naval Medical School staff. Many thousands of buoyant ascents have now been accomplished in the escape tower whilst in September 1959 successful buoyant ascents were made from a submarine of the United States Navy when lying at a depth of more than 300 feet off Key West, Florida to set the seal of success on the method.

This Laboratory has also been responsible for studies on the pressure chamber and very numerous trial dives at sea which were designed to effect improvements in the Royal Navy's decompression tables. An indirect result of that work was seen when the Royal Navy broke the world deep diving record recently, a dive which was supervised by the naval medical officer who

was responsible for the last experiments and trials which led to the revision of the current tables as these are used today.

The recommendations of the Life Saving Committee led to the formation of the Standing Naval Life-saving Committee which has since developed the new rubber twenty and eight man life-boats and their equipment and the training procedures associated with these. The R.N.P.R.C.'s Bureau of Sea Submarines had advised on the physiological and medical aspects, carrying out raft trials at moderate temperature and transport trials to identify the appropriate practicable routes for a long sea day survival and other trials to identify the most suitable motion sickness remedy or the best way of obtaining adequate supplies of potable water. The submarine habitability crews referred to earlier employed a seven-week period of observations towards the end of 1945 in the first A-class submarine which was, as of course, fitted at that time with the standard. This was followed in 1947 and 1948 by three long screening crews in different locations on all of which medical investigations were carried to measure the environmental factors and observe the effects on the crew, particularly the novel effect of fluctuating static-plate pressures and occasional sharp changes in pressure. These enabled the characteristics of the 'submarining' submarine environment to be delineated.

The workers at Singapore provided the chance to the various programme of climate research and much of the information which is needed to define the requirements of men who have to live and work in warm climates or for short periods in high temperatures; although further work on the latter aspect and probably the former too may be called for later. The work of the Applied Psychology Unit at Cambridge has been closely co-ordinated with that of the Department of the Royal Psychologist Admiralty and the Unit for Research in Working and Climate Efficiency at the University of Oxford to solve many of the naval problems of the human operator and his equipment under the aegis of the Operational Efficiency Subcommittee. The underwater blind studies have been completed and the results have been applied as appropriate to meet the needs of the Naval Staff. Lastly, the Human Subcommittee is surveying past histories of fitting habitation facilities where protection is necessary and advantages the practice of naval radiometry and the standard of hearing to be required of different categories of naval personnel.

During the past year 1959 the more prominent topics which have been discussed or investigated by the R.N.P.R.C. and its various Committees have included the effect of loss of sleep on efficiency, the effects of immersion in very cold water and ways of protecting untrained persons, the physiological principles basic to the design of ventilated suits for wear in very hot environments, the evaluation of the newer methods for ensuring welfare further studies to re-examine the effects of noise on hearing and on performance and the possibility of recovering from short flush water supplies by drinking some sea water, a practice which has now been confirmed to be unacceptable in the Navy. In addition various new methods for investigating untrained persons primarily in fielded situations including evoked air respiration,

have been evaluated in association with the Research Department of Anthropology of the Royal College of Surgeons of England by direct arrangement with the Medical Director-General and consideration of the adoption of the latter method by the Navy has now been referred to the R.N.P.R.C.

This brings the story nearly up to date. No detailed reference has been made here to those aspects of research which presently concern flying personnel which are discussed together with the work of the F.F.R.C. elsewhere. With the advent of the nuclear-powered submarine the study of submarine operations will have to be carried considerably further than was necessary for the "pre-war" or "short-staffing" submarine and associated research; a continuous twenty-four-hour day seven-day week exposure to an enclosed space sustained for weeks on end rather than maximum exposure with daily break or refreshment for several hours.

No attempt has been made in this short account of eighteen years of Naval personnel research to discuss the results attained in any detail or to list the names of the numerous individuals within the Navy and medical officers and civilians of other branches, and members of the Scientific Service or outside the Navy—in universities, research institutes, other Government departments or in the other military Services who took part. It would suffice to say that a great many individuals were concerned. The relevant papers and reports are available at the Admiralty and in the Royal Naval Medical School and much of the work has been published or incorporated in Books of Reference for those who wish to pursue the matter further. But enough has been said to show that pattern which has been followed so far and how this has been done and primarily by the needs of the naval user for technical information necessary for the maintenance of operational efficiency, and by the user's initiative in bringing the problems requiring research or elucidation to the attention of the R.N.P.R.C. through the normal Service channels.

THE WORKERS

In brief these lie from the established agents in the appropriate laboratories of the Royal Naval Scientific Service—the Royal Naval Physiological Laboratory, the Admiralty Research Laboratory etc., of the Royal Naval Medical Service—the Royal Naval Medical School, Royal Naval Air Medical School medical officers attached to the hospitals of Aviation Medicine, Peterborough, others attached elsewhere to other laboratories, stations or Government departments, the naval hospitals and various Committees of the Medical Research Council particularly but by no means exclusively, the Royal Naval Personnel Research Committee, and a variety of inter-Departmental committees.

Those who do the work are however more important than the place in which they do it, and at least as important as the administrative structure which supports them, and this applies to personnel research as much as it does to any other field of scientific endeavour. The selection of the most suitable men, in going for the solution of a particular problem by the

R.M.P.R.C., and the mission and functions of the Committee in ensuring that first things come first, that the main effort is exerted in the direction where the Navy needs it most, and that personnel research in the Navy is co-ordinated smoothly and effectively with similar endeavours elsewhere in this country, the Commonwealth, the United States of America, and the North Atlantic Treaty countries, as appropriate, are the principal occasions which are essential.

THE ROLES OF THE NAVAL OFFICERS

From the very nature of the problem under discussion, it is obvious that the naval officer has had a large part to play in this development up to the present. The backbone of the Operational Efficiency Subcommittee was provided by early stamp prior to January 1941, by junior officers (post-graduate captain officers) and those concerned with communications together with their colleagues of the Royal Naval Scientific Service who were engaged with them on developmental work. The supervisor of Dring provides the main stimulus for this aspect of the work of the Underwater Physiology Subcommittee and Flag Officer Submarines, and the Standing Committee on Submarine Escape sponsored most of the remainder of its activities. The Chairman of the Naval Life Saving Committee and the members, provide the practical problems on which medical advice is needed from the Survival-at-Sea Committee, and the Hearing Sub-committee is guided by the various departments who have to cope with these subjects, the protection of personnel and the use of hearing in detection systems, such as those which employ noise or water apparatus. Medical officers again, the naval officers, contribute less generally less on the staff or seconded than than by direct participation in research, but those have been a considerable number of notable exceptions over the past.

It is only natural that the primary object is the study of man, not of hardware, that medical officers should have participated in this work to a much greater extent than those of other branches. They have either participated in or carried out nearly all the studies in ships and submarines since the first submarine used for Merchant anti-U-boat. They also played their part in the wartime laboratory studies of the groups at the National Hospital Queen Square, the Applied Psychology Research Unit Cambridge and the Admiralty Experimental Driven Unit Singapore, the Unit for Research in Smoking and Chronic Efficiency, Oxford, the Department of Experimental Medicine Cambridge, the Warships Research Unit on Dentures at King's College and the Research Department of Aeronautics, Royal College of Surgeons. There have also been very many middle-men. Those who while fully employed in another capacity in naval hospitals, ships or other appointments have given freely of their time and taken on added responsibilities to help along projects which at times could not have been accomplished without the assistance but also and those speculate specially in epidemiology, anaesthesia, pathology, medicine and hygiene as well as non-medical medical officers have made notable contributions to naval personnel research on the authority of

the "R.N.P.R.C." reports clearly shows. It is on these private works that the success of the contributions made by the Medical Branch largely depends.

The time has long passed when the naval medical officer who wished to engage in the investigation of a problem is likely to be passed with cold disengagement, provided his project is wisely conceived and he is competent to handle it, either with or without outside advice and assistance which can be obtained in a variety of ways within the scope of the paper.

One of the difficulties recognized frequently in personnel research is to define the problem, to identify the susceptibles which are likely to respond to laboratory or field investigation, and once they are defined to keep projects "on the rails" to ensure that the answer eventually obtained is directly relevant to the practical basis of the situation. This is where the implied or unvoiced "public role" has in the past made its greatest contribution.

Not all naval medical officers have the inclination or the ability to indulge in research work or relevant investigations. Probably not more than one in ten will have the opportunity. It is of upmost importance therefore both to the Service and the individual that the efforts of those who can tackle the problems, whether as personnel research or in other fields, should be productive and inspiring, and when there are certain matters, between groups co-ordinated. For this reason medical officers are requested on Admiralty Fleet Order 1306/39 to inform the Medical Director-General of the Navy and the Director of Medical Research at the Royal Naval Medical School through the appropriate Service channels of any medical or applied medical research which is carried on in the hospitals establishments or ships to which they are appointed, and to furnish a brief description of the scope and object of the work. This enables arrangements to be given at times when it is needed and keeps the Medical Director-General informed as to where the medical research potential in the Navy is to be found.

ACKNOWLEDGEMENT

I am deeply indebted to the Medical Director-General of the Navy, Sir George Vice Admiral Sir Cyril May K.B.E., C.B., M.C., F.R.C.S., Q.H.S., for permission to publish this account; and to Doctor R. S. Ladd and Doctor R. C. Norton of the Medical Research Council's Staff for most helpful advice and comments.

FURTHER CLINICAL TRIAL OF A NEW ANTHELMINTIC DILOBENTRIN (PFIZER) BRAND OF INTIBAZANINE

22

Sergeant Commander J. GLASS, R.N.

Following the clinical trial conducted in the wards of the Naval Base Hospital, Singapore to assess the efficacy of Deloben (Pfizer) brand of Dilobenzine as a broad spectrum anthelmintic reported in the *Journal of the Royal Naval Medical Service*, No. 1, 1959 a second therapeutic trial was conducted shortly after the first using the same substance in enteric coated form, each containing 100 mg. Dilobenzine.

PLAN OF TRIAL.

30 cases were selected and divided into groups of 5. Each of these groups of 5 cases comprised of code-in-patients selected by Medical Officer concerned from patients' and their laboratory reports were given graduated dosage to determine maximum efficacy linked to concentration and frequency dosage.

FORM OF TRIAL.

	Dosage and frequency	Period of treatment
First group	500 mg. i.d. for 3 days	4.0
Second group	500 mg. i.d. for 3 days	3.9
Third group	500 mg. i.d. for 2 days	4.1
Fourth Group	500 mg. i.d. for 1 day	3.8
Fifth Group	500 mg. i.d. for 1 day	3.7
Sixth Group	1,000 mg. b.i.d. for 1 day	3.9

The results of examinations and trial details were recorded following laboratory reports or three follow up stool checks on completion of dosage in each case. The final stool check took place four days after completion of therapy to exclude reinfestation of intestinal worms.

Note: no tolerance and side effects were recorded in the one bed selected as well as any other complication considered by the Medical Officer in charge of case to be of any value for the purpose of this second trial.

Findings

Tables Two & V record the trial features and results on the 30 cases under review.

The Panel of 12 New Anthelmintic Dose Studies (Pilot) Board of Anthelmintics

Treatment—See Quantities, Basis of Trial, Results
100 mg. daily for 10 days; 100 mg. 1/2 for 10 days; Total 10 g.

Code	Subject	Type of infection	Effects	Anterior diagnosis or symptoms
1	Age: 10 Sex: Male	Ascaris	Pasted AS & ANC Cured by TR	Cough
2	11 Indian	Ascaris	Pasted AS & ANC Cured by TR	Cough
3	11 Chinese	Ascaris	Cured by TR	Mild colitis
4	11 European	Ascaris	Pasted AS & TR	Diarrhea
5	11 Indian	Ascaris	Cured by TR	Diarrhea

Case Nos. 7 and 8, 11 and 12, 13 and 14 are 3 individual persons who were given second doses at the same dosage and at least one of 10 and 11 the second course failed to clear Ascaris infestation in the reported dosage.

(By SURGEON GENERAL: Doctor HILLING: 1/2 for ten days Total 1.5 g.

Code	Subject	Type of infection	Effects	Anterior diagnosis or symptoms
1	11 Indian	Ascaris	Pasted AS & TR Cured both	Chlorocephalitis
2	11 Male	Ascaris	Cured both	Diarrhea (R. R.)
3	11 Male	Ascaris	Cured both	Diarrhea of legs
4	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
5	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
6	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
7	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
8	11 Male	Ascaris	Pasted AS & TR Cured both	Total
9	11 Male	Ascaris	Pasted AS & TR Cured both	Total
10	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
11	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
12	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
13	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
14	11 Male	Ascaris	Pasted AS & TR Cured both	Total
15	11 Male	Ascaris	Pasted AS & TR Cured both	Total
16	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
17	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
18	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
19	11 Indian	Ascaris	Pasted AS & TR Cured both	Total
20	11 Indian	Ascaris	Pasted AS & TR Cured both	Total

(By SURGEON GENERAL: Doctor HILLING: 1/2 for one day Total 1.2 g.

Code	Subject	Type of infection	Effects	Anterior diagnosis or symptoms
1	11 Indian	TR	Cured	Asthma
2	11 Indian	ENT-VIR & TR	Cured both	Total
3	11 Indian	Ascaris	Cured both	Diarrhea of stomach
4	11 Indian	Ascaris	Cured both	Diarrhea (L.) Total

(By SURGEON GENERAL: Doctor HILLING: 1/2 for one day Total 1.2 g.

Code	Subject	Type of infection	Effects	Anterior diagnosis or symptoms
1	11 Indian	Ascaris	Cured	Diarrhea of large intestine
2	11 Indian	Ascaris	Cured	Diarrhea of large intestine
3	11 White	Ascaris	Cured	Diarrhea of large intestine
4	11 Chinese	Ascaris	Cured	Diarrhea of large intestine
5	11 Indian	Ascaris	Cured	Diarrhea of large intestine

(By SURGEON GENERAL: Doctor HILLING: 1/2 for one day Total 1.2 g.

Code	Subject	Type of infection	Effects	Anterior diagnosis or symptoms
1	11 Indian	Ascaris	Cured both	Diarrhea of large intestine
2	11 Indian	Ascaris	Cured	Total
3	11 Indian	TR	Cured	Total
4	11 Chinese	Ascaris	Cured	Diarrhea of large intestine
5	11 Chinese	Ascaris	Cured	Diarrhea of large intestine

NOTE.—TOLERANCE.—In only one case (No. 11) was there tolerance which occurred the first day (one hour after the last dose). In a few cases there was tolerance after the first dose which disappeared after successive doses.

*Note: All—Anterior: TR—Trichuriasis; ANC—Ancylostomiasis; ENT—VIR—Enterobius vermicularis.

Table II.—Ethnic Group and Age Group of Patients Treated by Method of Administration.

		Under 30	30-39	40-49	50-59	60-69	Over 60	Total
Asian	1	1	7 ^a	4	1	0	0	10
Indians	1	1	1	1	0	1	1	4
Chinese	0	1	1	1	0	1	1	4
Malay	0	1	0	1 ^a	0	0	1	2
Caribbeans	0	0	1	0	0	0	1	1
Total	1	1	1	3	1	1	3	10

^aIncludes the 3 patients who were given free amount of treatment.

Table III.—Patient's Age Distribution, in Relation to Administration and Drug used.

		Under 30	30-39	40-49	50-59	60-69	Over 60	Total
Drug		1	1	6	7	2	1	20
Tramadol	1	1	0	4	1	0	1	6
Amitriptyline	1	1	4	3	2	1	10	21
Imipramine	1	0	0	1	0	0	0	1

Table IV.—No. of Patients Under Treatment with respect to Medication Received, Frequency and Age Groups.

		Under 30	30-39	40-49	50-59	60-69	Over 60	Total
No. of patients with single administration	1	1	1	2	0	1	1	5
No. of patients with double administration	1	1 ^a	4	0	2	0	0	7
No. of patients with triple administration	0	1 ^a	0	1 ^a	0	0	0	2

^aIncludes Cases Nos. 1 and 2 had AG & TR and Amitriptyline, while others.^aCase No. 1 had Tramadol, imipramine and TR, while case 2.

Table V.—Comparison of Duration Treatment in the Total with Various Dose of Drugs or the Two Major Antidepressants.

Antidepressant	Duration		Duration		
	Total	No. of cases	Avg. days	No. of cases	
Imipramine	days	cases	days	cases	
200 mg. x 1 d. daily	4.8±	1	1-107 ^b	1	2-100 ^b
200 mg. x 1 d. twice	2.5	2	1-107 ^b	2	4-100 ^b
200 mg. x 1 d. thrice	4.7±	1	1-107 ^b	1	4-100 ^b
300 mg. x 1 d. daily	4.8±	4	1-107 ^b	5	4-100 ^b
300 mg. x 1 d. twice	1.7±	4	1-107 ^b	4	2-100 ^b
300 mg. x 1 d. thrice	4.9±	1	1-107 ^b	1	2-100 ^b

DISCUSSION

Tramadol therapy for Amitriptyline and Tramadol, as single or mixed infusions is extremely efficient as the usual dosage increases as shown in this clinical trial. Long-term dosage over longer periods does not appear to influence effectively. Thus as the drug is fully non-absorbed, the feature of fairly drug concentration acting for a short period is the method of those.

The other common use of excellent tolerance by the tablet method of presentation favours short period high dosage therapy.

The Use of a New Antihelminthic: Delbavox (Phary) Brand of Dewormer

It was noted by ward and laboratory staff that in the short-period assay, dosage count the patients' body much after treatment commenced commenced in many of partially skeleto-motor patients. It is highly likely that the enter-coating envelope resistance for some patients is too resistant to solution and breakdown in these cases.

The optimum dosage was found to be 900 mg. i.e. for one day.

In this trial Trichuriasis-infected patients were noted to be slightly more responsive to therapy with Delbavox compared to Ascaris infected ones at high total dosage over a longer period, and equally responsive in both instances to the higher short-period dosage therapy.

Conclusions

Delbavox has been used effectively as an anthelmintic for Trichuriasis and Ascaris. The capsule presentation of the first trial has been substituted in the present trial by enter-coated tablets of 100 mg. Delbavox (Phary brand of Dewormer). The reader recommends that the tablets be made available in larger doses if again repeated. An additional suggestion is made for the production of the tablet with an alternative lesser degree of enter-coating.

Act acknowledgement is graciously given to the ward laboratory and office staff of the Naval Base Hospital Singapore to Dr. J. M. Phee, Far East Medical Representative of Pfizer Corporation for the supply of Delbavox and co-ordinating all investigations made under bibliography, and to the Medical Director General of the Navy for permission to publish this report.

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THE BASIC PRINCIPLES OF TROPICAL CLIMATOLOGY AND DISEASES DUE TO HEAT

BY

Sergeant Lieutenant J. H. SOWARD, R.N.

Broad studying Tropical Diseases is difficult if it is essential to have some understanding about the climatic environment in which Tropical Diseases are found and which is so important in the aetiology of nearly all these diseases. It is instructive to consider three main subjects—firstly the climates of the Tropics, secondly factors causing differing climates in different parts of the Tropics, and finally the effects of these climates on the physiology of man and adaptation to them; thirdly, the diseases caused by the physical effects of these climates, where adaptation has not become complete.

TROPICAL CLIMATOLOGY

As regards climates in the Tropics, it is as well to describe these briefly and then to consider in more detail some of the factors which are responsible for the presence of a particular climate in a particular place.

Numerous classifications of climates do exist—one well-known classification lists 14 different world climates—but it will be enough to consider three main types of Tropical Climate and some of the many factors which may influence them. These three types are as follows: The Wet Tropical Climate, The Dry Tropical Climate and the Desert and Semi-Arid Climate. If one starts at the equator (Map 1) very roughly speaking, the Wet Tropical Climate extends to latitudes 10° N. and 10° S. The Dry Tropical Climate lies to the north and south of the Wet Tropical zone and the Desert and Semi-Arid areas north and south of the Dry Tropical zone.

The Wet Tropical Climate characterizes such places as Northern South America, Equatorial Africa, Malaya and the East Indies. This climate is predominantly wet and warm. The humidity is often as high as 90 per cent and the temperature about 80° F. Extremely high temperatures are not experienced and the nocturnal fall of temperature is slight, rarely exceeding 10° F. Seasonal fluctuations are small. In the former it will be experienced at Singapore.

The Dry Tropical Climate characterizes such countries as Central South America, Central Africa, the West Indies, East Africa, India, S.E. Asia and Northern Australia. The climate is characterized by alternating seasons of



MAP. 1.

- [Solid black square] WET TROPICAL CLIMATE
- [Square with diagonal line] DRY TROPICAL CLIMATE
- [Two squares stacked vertically] ARID & SEMI-ARID CLIMATE



MAP 2

PERMANENT WIND ISLANDS

(Conditions as felt on sea except that the whole system of winds and rains moves in that north, and the N.W. Islands are replaced by the S.W. Islands in the Indian Ocean, the S.E. Islands by the E. Islands and the W. Islands by the E. Islands in the China Sea)

drought and heavy rainfall. It is really a climate which fluctuates between wet tropical conditions and semi-arid conditions. During a prolonged dry season extremely high temperatures develop, whereas in a long wet season the temperature falls and the humidity rises, to approximate those of the Wet Tropical Climate. One will experience this change in the West Indies, Mexico and the new basin of Managua. Hong Kong is on the northern fringe of this zone.

The Desert and Semi-Arid Climate characterizes such places as Mongolia and parts Northern Africa and South West Africa, Arabia, Persia and Southern Russia, Western China and Central Australia. This climate is obviously hot and dry. The temperature may reach more than 110° F. at noon although it rarely exceeds 100° F. The nights are cool or even cold in comparison and the humidity is low—about 10 per cent. These conditions prevail throughout the year with extremely little, if any, seasonal variation. It will be most likely to meet these conditions temporarily in passage through the Suez Canal, the Red Sea and sailing in Aden and, perhaps more permanently, in the Persian Gulf.

Climate may be defined as the combined effect of the sun, the atmosphere and the earth at any one place.

The sun produces its influence by heat and light.

The atmospheric effects are due to humidity, pressure and wind.

The earth is responsible for influences due to ocean currents, the relative proportion of land and sea, latitude, altitude and the nature of soil, plants.

These influences combine to determine the position of the Heat Equator (Map 1) which separates the belt of maximal mean annual temperature. The belt for the most part, considerably north of the geographical equator, in Central America and Mexico it bands northward to a latitude of approximately 25° N. and in part of Africa it lies at 20° N. In the East Indies it lies at about 10° S. and for the remainder lies roughly 10° N. of the geographical equator. These facts demonstrate that the zones for the three types of Tropical Climate are not determined simply by the distance north or south of the geographical equator. This is where other factors come into play.

One of the most important factors is that of the winds and its currents especially the cold ones (Map 1). For instance, the Penn current is probably responsible for the constant northward position of the heat equator in Central America and Mexico. The same thing happens in Africa where another cold current pushes the heat equator northward through Saudi Arabia and more cold currents from the Benguela flow push it south through the East Indies. The California current keeps the heat equator in the land of the geographical equator until just before it reaches the Americas again once more.

The different effects of land and sea are best illustrated by the fact that the sun warms the atmosphere directly in a small extent only. The air is warmed mainly by dark heat radiated from land and sea. Sun, because it is black, does not warm up to anything like the extent that the land does and therefore the bottom climate, all other things being equal, will occur in the order of large

areas of land where lower temperatures will be found at midday compared by day a rate of rise—show the effect of tropical winds and the extreme heat of the deserts of Northern Africa, Australia, Peru, Central Asia and Central Australia (Fig. 1).

The importance of a locality shown daily and annual periodic variations as smaller have slight. The Diurnal variation is due to the sun's rays falling on dry earth and heating it, and so it is more marked in the hot dry desert climates and minimal at sea. In winter most climates are intermediate positions more. The annual variation depends largely on the inclination of the earth's axis, and it passes round the sun. At the Spring Equinox (21st March) the sun is almost vertically on the equator at noon after which the northern hemisphere becomes inclined more and more towards the sun, and about 21st June, about 23° vertical over the Tropic of Cancer at noon (23° N.). At the Autumn Equinox (21st September) the sun is vertical over the equator after which the southern hemisphere inclines away from the sun until about 21st December. It is then vertical over the Tropic of Capricorn (23° S.). Hence the sun is vertical over any one place between the two Tropics at noon twice a year.

Temperature also varies actually with altitude. On the average for every 500 ft. one goes up, the temperature decreases by 1° F. Other factors however are involved such as the expansion of air (air when heated, air expands the energy represented by heat is converted into motion), condensation of aqueous vapour when perspiring glands release heat radiated from the body, the increased amount of earth pressure gives less heat being radiated into the air, and lastly the effects of winds depend on whether they blow from a hot or cold source. However the proportionate growth holds good for most areas and we can assume that although the low altitude of a particular country may have a typically tropical climate, the conditions at the high mountain will be quite different. The highest stations of Mount Kenya, which lies on the equator, are perpetually covered in snow, and the Cameron Highlands, in the north of Malaya, have a very pleasant climate indeed. The mountain climate has been created from the loss of Tropical Climate in its ascent (above the Tropical Zone as well as below).

Another important factor which influences the particular type of climate one will find in a place is the pressure of the atmosphere. At any given place this depends largely on the composition of the air. Apart from the effect of atmospheric pressure on the oxygen concentration which is so important in Aviation Medicine and Underwater Physiology, variations in barometric pressure cause winds which have a very special influence on any particular climate. They can be divided into Permanent, Periodical, Local and "Climatic" winds.

Permanent winds are those which exhibit the North East Monsoon which is really a trademark. Generally speaking, a high barometric pressure is recorded at sea level about 20° N. and 8° of the equator. The high pressure descends through the equator because of the heating of the air and at the equator the hot air ascends with considerable force to very high altitudes.

Though the pressure at 30° is higher than that at the equator at sea level, it is considerably less at higher altitudes. As a result, air passing upwards from sea level at the equator into higher altitudes will then flow eastward at least towards 30° (Fig. 1). As these currents flow polewards they are compressed and



FIG. 1.—Section of the earth showing the formation of the Prevailing Winds and Calms

forced downwards by increasing pressure mainly due to the cooling of the air and reaching land at 30° N. and crossing the ring of light pressure around the earth that have already been noted. When these currents of air reach the latitudes of 30° N. or S. they move mainly towards the equator. The resultant wind poleward. From these facts one can explain the seasonal calms, where the air is ascending steadily, the subtropical calms or doldrums, where it is descending vertically and dividing into N. and S. moving surface currents. Between the latitudes 30° N. and 30° S. one therefore finds the N.E. Trades and N.W. Monsoon, and the S.E. Trades. The northerly or southerly direction of these winds is due to the fact that has already been mentioned and the easterly direction is due to the rotation of the earth. These winds are not universal—they are only to be seen typically over the oceans, where the temperature is equable and there are no land continents to deviate them from their course. The temperature of the atmosphere, as has already been seen, is one of the factors that determine the barometric pressure and, consequently, the prevailing winds. As a result, the trade-winds together with the calms north and south of them shift their position according to the temperature. During the summer months they advance northwards and in winter recede southwards. The tropical rains as well as snowfalls, depend largely on the movement, which in itself depends upon the inclination of the axis of the earth towards the sun.

Periodical winds are known as Monsoons and are characterized by the North-East and South-West Monsoons of the Indian Ocean. They are due to the heating of large areas of land in one part of the year and not in another.

The heating of the plains of Asia during the months of May to August causes the air to rise vertically just as it does at the equator. The S.E. Trade which is blowing north of the equator is drawn northwards and deflected in an easterly direction, so till the depression thus forming the S.W. Monsoon. The N.E. Monsoon is, as has been already noted, really a wind-reversed. The same principles apply to the N.W. and S.E. Monsoons. The N.W. Monsoon is probably mainly due to the heating of the Asian high desert, which causes the N.E. Trade, blowing north of the equator, to be driven southwards and deflected in an easterly direction. The S.E. Monsoon is, like the N.E. Monsoon, mainly a trade wind, but in this case the masson is carried across the equator by the pull exerted by the hot Asian plains.

Local winds are of great importance in Tropical Countries. The most important are due to the warming of the land during the day giving rise to the heated on-shore breeze and its cooling at night and a subsequent dry off-shore breeze. These vary immensely according to the amount of cloud present, which in turn determines the amount of terrestrial and solar radiation. The cool, dry, off-shore wind is dangerous so far as it exerts massive friction and sharply cools the body.

Variable tropical winds cause in the equatorial and sub-tropical regions of rain.

Lively a word or two about humidity and rainfall. Man can bear very high temperatures easily so long as the air is dry. If the humidity is also high loss of excess heat by evaporation of sweat is reduced and dangerous conditions prevail. Thus humidity is of the greatest importance. It is, of course, due to evaporation from the surface of all collection of water, the sea, rivers, lakes and even land when this is wet. The capacity of the air to hold water in suspension is doubled for every 2° F. rise in temperature. Therefore the greatest humidity occurs in the wet tropical climate which combines a high temperature and a source of water for evaporation. Aquatic vapour rises so cold air comes and condenses to form dew. The result is cloud. When the water droplets become too large and heavy to remain suspended they fall as rain, hail or sleet. Rapid precipitation causes a considerable amount of heat to be suddenly lost and this fact illustrates the value of collection of water in keeping the temperature equable. By wrapping wet flannel or silk round a bottle of beer and exposing it to the sun, as in a tropical climate, a fair can enjoy quite a cool drink even in the hottest climate provided that the air is not saturated.

The rainfall in a locality is determined by its position relative to the equator. At the equator the heated air is full of aqueous vapour brought by the trade-winds from the sea. The sun's high heat, cool off-shore, and condenses to form cloud and rain. Now the whole system of trade-winds and calms moves north and south depending on the season of the year, as has been already noted, and so also does the rain-belt which results from the combined effects of the trade-winds and the sun-spots. If one draws two lines A-B in fig. 20 north and south of the equator to represent the boundaries of the rain-belt at the time of the two equinoxes, when the sun is vertically over the equator, one can draw two

NORTHERN HEMISPHERE



SOUTHERN HEMISPHERE

FIG. 2.—Zones of Rainfall.

further from (B) for the same rain belt, at the time of mid-summer and two more (C) for mid-winter, in the Northern Hemisphere. There are therefore three zones on both sides of the equator where one will expect differing rainfall. In the Northern Hemisphere in the first zone, which is between the equator and 10-15° N, the N.E. Trade will be blowing in March and the sun will be vertical, it will therefore be raining. This wet season will be followed by a period of calm and dry weather. In September the S.E. Trade will be blowing, the sun will again be vertical and it will again be raining. This will again be followed by a period of calm dry weather. So there are two short wet seasons and two short dry seasons. In Zone 2 between 10-15° S and 20° S, the conditions are basically the same, but the times when the sun is vertical are so shortly separated that the rainy seasons merge one into the other so that there is a long wet season in the summer and a long dry season in the winter. In Zone 3 within the outer limit of the coast-tops between 20° and 30° S, the sun is only approximately vertical once a year and so there is only a short rainy season of three to four months. The rest of the year will be dry. Beyond Zone 3 the conditions will be amongst the drier in the world, with rare if any, due to the extreme equatorwardly of the Polar south. The areas of rainfall coincide with the zones of the three Tropical Climates that were mentioned at the beginning. Zone 1 coincides with the Wet Tropical Climate, Zone 2 with the Dry Tropical Climate and Zone 3 with the Semi-Arid Climate. The zones are of course, only approximate, sometimes exceptions and intergrading conditions exist. The Monsoons notably alter these conditions in the Indian Ocean, China and Northern Australia. The S.W. Monsoon is responsible for very rare falling in

Bathing India and Hawaii. The N.W. Monsoon breathes life in the eastern North of Australia. The S.E. Monsoon brings rain to China and N.E. Asia.

ADAPTATION

Adaptation to any particular climate requires an ability on the part of the body to maintain a normal body temperature. This depends on the power to balance heat gain with heat loss. Heat is gained from internal body metabolism or external sources. Heat gained from without the body is by radiation, conduction and convection e.g. by radiant heat from electric fires, conducted heat from hot-water bathtubs and convection heat from whirled air currents. Radiant heat is gained from the sun, the earth and any hot air eddies in the atmosphere circumscribing such as the cool plating of ships, conducted heat is gained from walls or surfaces due to convection and conducted heat remaining the air, conducted heat is a less important factor unless one is heated enough to lie on the hot deck like the ancient mariner.

Heat is lost by evaporation from the skin to cooler objects, by conduction from the skin to cooler contacts, by convection from the surface of the skin to cooler currents and, lastly, by evaporation of sweat from the skin and water from the lungs. In desert climates it is rare that one comes up with cool objects, common occurrences. In fact the reverse is often true and heat principally gained in this way. The most important mechanism of heat loss is therefore evaporation. For each gramme of water evaporated one loses just over 1/4 a calorie of heat. In warm, moist climates however, evaporation is hindered or even prevented by the high humidity and heat is lost mainly by radiation, conduction and convection. In these circumstances heat loss may be hindered or even gained if tissues drying is more. In addition to reducing heat loss by radiation, conduction and convection, condensation and absorption of moisture by the clothing will assist in the regulation of heat.

The response of the body to heat must be an attempt to maintain a heat balance. This is achieved by peripheral vasoconstriction excepted minute regions of vasodilation, hyperaeration of sweat and by a reduction of basal metabolism. In addition, less heat is produced by an inability to perform continuous heavy work, without distress and, in extreme cases, by fatigue. However changes induced in the skeleton to accommodate the tropics, in old men disappear and he becomes increasingly less physically adapted to the new environment. This process involves a reduction in the sweating threshold, a diminution in the salt content of the sweat and keratinisation. These changes are said to occur more readily in middle-life. It is probably true, to say that the elderly are less able to regulate their body temperature because of the comparative inefficiency of their regulatory system which is associated to age. But it is doubtful whether this is true of children although it has long been accepted as so. In all Tropical Climates, children seem to do well provided that tropical hygiene is practised.

Apart from physiological adaptation, environmental adaptation is of great importance. The factors involved range from the use of suitable clothing in air conditioning of ships and buildings. The former privilege will, of course, be

III. The Basic Principles of Tropical Climatology and Diseases Due to Heat

different in different climatic conditions. In the desert and semi-arid climate it is important to lose heat gain from radiation, convection and conduction and to end heat loss through evaporation. Clothing should therefore be white to reduce radiation and losses and pattern to reduce convection and end evaporation. Several layers of loose will amount to a liner or so and, as well as white, will will be required to replace it. The nights may be cool or even cold and warmer clothing may then be required. Needless to say, sun should be taken in the shade during the day and as much of one's work and travelling should be done at night as possible. In wet climates there is no need to protect the body against heat gain and therefore clothing is not required for this purpose. The only necessity for clothing, basically, is for the protection of the skin against sun itself from the burning rays of the sun, whereas the loss of water the more will be the less loss by all routes. So far as adaptation of the skin itself is concerned, this is a gradual and relatively prolonged process necessitating only short exposures daily until adaptation is as complete as possible.

DISEASE DUE TO HEAT

Diseases due to heat result either from a failure to adapt oneself physiologically or failure in usage can's own control.

The effects of heat due to the unflooded rays may be mild or severe. Two main types of general disease are recognized (Table I) although there are numerous borderline cases which fall into neither of these categories. Heat exhaustion is characterized by prostration and circulatory failure associated with loss, of any, rise of body temperature. Under identical conditions heat exhaustion may develop in one person and heat hyperpyrexia in another. In addition, heat exhaustion may develop into heat hyperpyrexia if treatment is not adequate. Chronic environmental disorders, debilitating disease, extremes of age and old age, predispose to heat exhaustion, heat hyperpyrexia and/or heatstroke and younger patients.

In heat exhaustion symptoms usually develop rapidly and include weakness, nausea, headache and giddiness. Symptoms can occur. The temperature may reach 102° F. but is usually often normal or subnormal. The signs are those of circulatory failure and include a slow S.P., weak rapid pulse, paler and a clammy skin. Treatment is mainly symptomatic. Clothing should be loosened and the patient should lie quietly in a shady place where there is a free circulation of air. Shampooing, however, should be avoided. If the temperature is subnormal, the patient should be wrapped loosely in blankets and hot water bottles applied to the feet. Cardiac arrhythmias may be noted but this is unlikely and most patients recover with rest alone. Diagnosis is usually easy.

Heat hyperpyrexia or heatstroke is characterized by very high fever and associated symptoms. Circulatory collapse and coma may develop in the later stages. Symptoms usually develop slowly, beginning with exhaustion as much as forty-eight hours before the onset of the attack. Initial prodromal symptoms, which may pass unnoticed, include lassitude, weakness, breathlessness, photophobia and generalized thirst. At this stage there is a slight

TABLE I

Proportion	All or extensive		Local (Regional) 1	
	Symptoms	Diagnosis	Symptoms	Diagnosis
Chief				
Hypotension				
Early	Weakness	Weakness		
Intermediate	Headache	Giddiness		
Late	Stupor			
Body temperature				
Early	Under 101°			
Late	Normal			
Age				
Early	Circulatory failure			
Late	Low B.P. Weak			
	and rapid Pulse			
	Pulse			
	Decrease in			
Late	Circulatory collapse			
Obstetric				
Problems	Early			
	Sympathetic			
	Low			
Comprehensive				
Program	High pressure			
	Cloud			
	Red			

systolic and diastolic. About forty-eight hours after cessation of increasing there is a sudden sharp rise of temperature which may reach 103° or even higher. This may be accompanied by delirium or unconscious. Convulsions and vomiting are common, diagnostic complications. The pupils are contracted and the lower jaws and pupillary reflexes are rapidly diminished or abolished. The pulse which was at first rapid becomes weak and irregular. Cyanosis and clamminess of the skin together with Cheyne-Stokes breathing are late and dangerous signs. Alkalosis and a reduction of urinary chlorides are important signs. The spinal fluid is under increased pressure and contagion is usual. However, pelvic irritation and cholecystitis disorders may be present with a consequent depletion of chlorides and the development of acidosis. In untreated cases death supervenes very quickly indeed. A person attacked during the night may be found dead in the morning.

Complications include bronchopneumonia resulting from pulmonary congestion and sepsis are common.

Treatment must be quick to be effective, to save life. The aim is to cool the patient, reduce his temperature, replace lost heat and correct any cardiac or respiratory failure. It may also be necessary to control convulsions. The patient should be placed in a recumbent position on the coolest available place where there is free circulation of fresh air. He should also be stripped. The temperature is reduced by spraying with liquid water accompanied by a forced current to the skin and continuous fanning of the patient. He can with advantage be wrapped up in a wet sheet which is sprayed with water at frequent intervals and periodically exposed to fanning. The rectal temperature should be taken every five minutes and cooling discontinued when the temperature reaches 102° F. The patient should then be wrapped in a light dry blanket. The temperature should continue to fall for a time even though treatment has been discontinued. In cases where hypoglycemia has not developed, rest in a cool airy place, cool baths and plenty of cool fluids to drink are all that will be required. A close watch is however essential and symptoms have abated altogether. In severe cases of hyperpyrexia fluid will have to be given plentifully—infused using a 3 per cent dextrose should be given by continuous intravenous drip. Although the mechanism of the voluntary disorders of the confusion are not well understood, certain symptoms may be reported as signs of pulmonary congestion. Venesectors may then be necessary. Digital anorectics have been used to control convulsions and further reduction in somnolence induced by reducing a raised intracranial pressure. The only other important factor to be borne in mind is that heat exhaustion may continue without and vice versa. If there is any doubt about this entomologist should be engaged.

Investigation, although important, should be performed only when danger of death from hyperpyrexia has been guaranteed. Clinical investigations, besides the examination of blood film for malaria should, in a severe case, include the following:

- (1) Examination of the blood to exclude sepsis
- (2) Examination of the urine to exclude diabetic coma and make full red blood cells and to determine albumin and absence of chlorides
- (3) Examination of the C. S. F. for early signs of meningitis and the determination of a raised pressure

The power to send may remain absent for as long as three weeks after recovery. Headache, photophobia and giddiness may continue for a week or so. These facts are indications for continued caution and patients should be protected as far as possible from exposure to heat during convalescence. Even after complete recovery persons who have suffered very mildly from heat hyperpyrexia may remain clinically susceptible to heat for many years.

HOT CLIMES

Hot climates are usually the same as miasms' climates and violent' climates and are due to salt depletion. Treatment consists of rest and replacement of salt and fluid in severe cases by intravenous infusion. Hot climates should be prevented by the intake of sufficient salt, usually in tablet form.

SYMPTOMS.

Sunburn is, of course, well known to all men in this country. The violet and ultra-violet rays will cause sunburn in strong winds and even if diffused by cloud or reflected by a bright surface. It is not confined to be in the direct rays of the sun. Pigmentation of the skin protects it from sunburn as does may have very little power of protection. Burners may vary from a simple hyperaemia to severe or, possibly, third degree burns. It may come with heat, painless, with erosion, blisters, fever and vomiting. It may also manifest with vasomotor control and sweating.

PRICKLY PEAR (MAMMILLARIA).

Prickly heat is one of the commonest and most important causes of irritation and loss of working hours in the tropics. It is confined to the polarised rays and is probably due to the lipoproteic salts of the epidermis. The intense redness is accompanied by a fine, subacute, vesicular rash and is predisposed to by exercise and friction. This is followed by oedema of the region which may give rise to weakness and exhaustion, if the area involved is large. The aetiology is said to be the formation of a keratin ring around the ostium of the sweat ducts combined with the drying of the epidermis. These conditions are produced by a combination of excessive sweating and factors which deprive the skin of its natural fatty secretion. These latter include frequent washing with soap and water and the use of powders and antiseptics (such as eucalyptus repellent). Treatment is aimed at the avoidance of predisposing factors and the application of lotions.

TICKLING, SHAKES.

This is a very common symptom in the tropics. In addition to the conditions which cause the complaint in temperate zones, nutritional causes and tropical diseases, shakiness commonly results from purely physiological causes. Hair-shakes is said to be due to the alteration in vasomotor control during micturition. It occurs in the extremities, especially the wrists and ankles, and is usually transient, requiring no treatment.

ACKNOWLEDGEMENTS.

I would like to thank Surgeon Captain Stanley Miles, M.D., M.B., D.T.M.&H., Royal Navy for his criticism and advice, and Surgeon Captain J. L. S. Coulter, D.F.C., F.R.C.S. Eng., L.R.C.P. (Bartyser in Law), R.N., for his encouragement and permission to publish this article.

Clinical Notes and Cases

NOTE ON A CASE OF CORONARY THROMBOSIS AT AN UNUSUALLY EARLY AGE

III

Sergeant-Captain F. H. LAMM, B.A.

The following case is thought to be of interest because the man was an extremely tall and distinguished Member of only 27 years of age. He had no relevant past history, and had not reported sick in all cases joining the unit in September 1929.

He collapsed, according to eyewitness accounts, about twenty minutes after the run of an easy 100 feet half way along Langley Hill. As the man was not preparing to climb up in a tree but had clung the hill in short chest beats when he suddenly collapsed it, dropped his pipe and collapsed. He could not speak nor lift his hands. Started at respiration, but not, according to the observer, had he ever been昏迷 (unconscious). He passed out on the ground in the early stages seems to have been alternating apnoea and hyperventilation. In a very short time he was floored and pale, and it is presumed that also at when death took place.

By order of the Chairman a post mortem examination was carried out by Dr. V. H. Rivers, the Consultant Pathologist for the South-East Coast Hospital Management Committee. I was present at the examination.

During dissection of the heart a patch of adherence was found in the right circumflex artery. Adherence to this patch was a blood clot and another clot was found further down the artery though it was not certain whether this was big or whether a big clot detached by the pull of the muscle when opening the vessel. In the posterior end of the right ventricle there were small bodies of muscle dislodged, apparently representing the very earliest signs of cardiac plethora. The rest of the heart muscle, the valves and the major blood vessels were perfectly healthy. No other abnormalities were found during the post mortem except minute varicosities in the blood-containing organs.

One would not expect a small artery to reach from such a prominent location as to form a vessel. It is presumed that acute fibrillation or a thrombus in cardiac failure.

I am indebted to Dr. V. H. Rivers for permission to use the information he obtained during his post mortem examination, and to the Command Medical Officer, Sergeant Rear-Admiral W. R. S. Proutridge, Q.H.P., for authority to publish.

AN UNUSUAL CASE OF DICOOMPRESSON URTICARIA

by

Sergeant Lieutenant W. M. HOLLISHOCK, R.N.

In an era when the number of cutaneous conditions held responsible for occupational allergic manifestations is ever-increasing, the following case is submitted as presenting some rather unusual features. It occurred during the course except involving grossly all new entry substances.

At 1400 on 10 Aug., 1943, Able Seaman J., aged 24, purchased an complete set of clothes from a shop with his pay. He had completed a 20-foot ascent from deck when soon afterwards and had done two more in the forecastle, was from 15 feet and one from 10 feet. He had been "blown up" in the body by a brother 20-foot ascent in the forenoon but this had not to be counted because another brother experienced difficulty in climbing ladders.

About a minute and a half after leaving the shop he entered two unopened which about 15 feet in diameter in the right hypochondrium, 10 feet from the umbilicus. These were surrounded by areas of erythema approximately 1½ to 2 inches. There was no edema, nor had he lost any of the blood. The patient could feel the surface of the present.

Upon the suddenly onset of the skin lesions (which had further since increased) signs of decompression disease, complete syncope and the shoulder was flexed upon. After compression to 120 feet at this instant, showed no further symptoms, decided to return to the present with one 10-second stop at 10 feet. During the course to 10 feet however he developed further similar transient patches over the trunk and shoulders. Onboard, at the rage presented the greatest difficulty. The development of further lesions during decompression suggested this third. But the skin overall remained pressure-prone, indurated against this. However, it was felt that the valid pressure was to re-expansion of the skin. This was done to a depth of 100 feet, and he was then brought to the surface with the following "stop":

- (1) 60 feet—12 minutes (prolonged to permit thorough re-expansion)
- (2) 40 feet—2 minutes
- (3) 30 feet—5 minutes
- (4) 20 feet—10 minutes

Clinical Examination During Decompression

At 60 feet: C.M.R. and chest—No A.D. Ruler remained positive and non-compressible. Merited dermatographism.

At 40 feet: For the first time went over the rash became more, especially over the shoulder.

At 30 feet: Thorough re-expansion of the central nervous system, chest and cardiovascular system showed no abnormality. Blood pressure 100/60. Pulse 18 per minute. Blood pressure 130/80. At this stage the expansion of the lesions was unchanged but the erosion had increased.

At 20 feet: After one minute of the "stop" the erosion had faded considerably and the eruptions were greatly improved.

Half an hour after leaving the re-expansion chamber the rash had almost completely faded and the eruptions had subsided altogether.

The patient was kept under observation for a further twenty-four hours but no other signs or symptoms developed.

Throughout oligopoly sales practice, personal and family history failed to reveal any evidence of previous allergic manifestations, either local or general. At this stage the diagnosis remained limited between the following possibilities:

(1) *Allergic Sensitivity to Chlorine*

This seemed most unlikely to be true when viewed in chlorinated pools without chlorine. (The water in the swimming Tubs is chlorinated to have a residual of 0.8 ppm.)

(2) *Allergic Sensitivity to Nitrogen*

The length of long winter exposure was so short (a few months only) as to render this unlikely, but the existence of asthma as a common symptom of chloropneumonia, although it appears [6] and it is quoted as being one of the earliest manifestations [3] of the condition.

(3) *Sensitivity to the Fibres of the Cloth*

In view of the fact that the description of the lesions corresponded approximately to the area covered by the fibro-patch cloth and felt, this appeared to be a very likely diagnosis. The cloth is made of fine natural stringy rubber on a latex base. The felt is of the usual thin wetting type.

Against this possibility is the fact that the patient had used the fibro-patch for his manual during the previous sixteen weeks. It may also be mentioned that the several respiratory illnesses had not exhibited any similar derangements.

(4) *Asthma-like Oligopoly*

The isolated nature of the lesions, without any found in other infants, suggests that this possibility may be excluded.

Experimental Test

In view of the differential diagnostic possibilities, a test patch that patch tests should be carried out with the fibro-patch fibres to establish or exclude them as the most likely alternative to fibrosis in causing the symptoms.

All patches were made up with pieces of about 4 mg cm⁻² size, centrally mounted on thin paper squares and applied to the skin of the back. The paper squares were secured with plaster strapping, which produced no reaction of itself.

The following patches were set up:

- (1) Blue webbing from the belt
- (2) Rubberized fabric from the sole fibre to skin
- (3) Rubberized fabric from the sole rubber to skin
- (4) Cleaning powder, obtained from a newly unpacked sole
- (5) Plain glass as a control.

After twenty-four hours, there was no reaction to any patch, so all the patch tests were soaked in chlorinated water from the tank and a further control, using ordinary tap water, set up. As there was still no reaction twenty-four hours later, the patches were soaked again.

Four days after setting up the patch tests, there was still no reaction of any kind. Having regard to the conditions of the test, a false negative conclusion seems reasonable.

Conclusion.

In view of the negative result of the patch test, the most likely diagnosis would seem to be one of ulcerated seborrhea or eczema under pressure possibly aggravated by physical irritation of the lip-gums. In spite of the comparatively short time under pressure there seems to be nothing to corroborate the suggestion that this was an allergic reaction to a small dose of the extract.

The possibility of trying to reproduce the symptoms by applying small quantities of oil subcutaneously, using halogen as a solvent, and subjecting the patient to further compression, was considered. Such a procedure did not prove profitable.

ACKNOWLEDGMENT.

I am grateful to Surgeon Captain W. J. Forbes-Gould, R.N. for permission to publish this article.

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THE ROYAL NAVY MEDICAL CLUB
ANNUAL DINNER, 1960

This Annual Dinner of the Royal Navy Medical Club was held in the Puried Hall of the Royal Naval College, Greenwich, on Friday 29th April, 1960. Surgeon Vice Admiral Sir Cyril May presided, and the following Guests and Mayors were present:

By Name: The Lord Mayor, G.C.P.O.; The Earl Carter and Viscount Cobbold, D.B.E.; Sir James Parkinson, Bt., A.C.F.R., F.R.S.; Sir John Parkinson; Sir Francis Lee, F.R.C.; Sir Alan Rendell, K.B.E.; Sir Alfred Shilton, A.C.F.R.; The Honourable Archibald, P. Armstrong, D.B.E., G.B.E.; Captain of the Fleet, The Right Honourable Margaret Fox, G.B.E.; Surgeon Rear Admiral W. H. Heath, Q.P.M.; Surgeon Rear-Admiral D.S.C., C. J. Flanagan, C.B.; Surgeon Rear Admiral, F. G. Hoare, C.F., C.B.E.; Surgeon Rear Admiral W. F. E. Melville; Surgeon Rear Admiral W. H. S. Monkhouse; Surgeon Rear Admiral S. G. Rawson, C.B.; Major General H. Quinton, C.B., Air Vice-Marshal; R. Surgeon C.B.E.; Air Commodore W. P. Simon, C.B.E.; Surgeon Captain M. H. Adkin; Surgeon Captain E. R. Alderson; Surgeon Captain F. W. Baderroth; Surgeon Captain E. A. Bayliss; Surgeon Captain H. J. Ching, Q.H.F.; Surgeon Captain J. L. D. Coates, D.F.C.; Surgeon Captain T. G. B. Gresham, Q.H.F.; Surgeon Captain H. H. G. Cooper; Surgeon Captain A. H. Flanagan, O.A.F.; Surgeon Captain G. L. Fort, Q.H.F.; F.R.S.; Surgeon Captain W. J. Farley Daniel; Surgeon Captain D. P. Goss; Surgeon Captain H. H. Hopkins; Surgeon Captain J. H. Hobson, Q.H.F.; Surgeon Captain H. H. Hobson, Q.H.F.; Surgeon Captain J. Johnson; Surgeon Captain C. Kenyon, C.F.R.; Surgeon Captain E. S. Leslie, D.F.C.; Surgeon Captain A. Levy; Surgeon Captain J. G. Marget; C.F.R.; Surgeon Captain H. W. Martin, F.R.D.; Surgeon Captain H. W. L. Monckton, Q.H.F.; Surgeon Captain C. Peacock; Surgeon Captain H. H. P. Price; Surgeon Captain H. A. W. S. Price; Surgeon Captain G. A. Vickery; Surgeon Captain H. W. Barnes; Surgeon Captain H. W. W. Whistler, F.R.D.; Air Commodore W. H. R. Rowan, C.F.C.; Captain, M. J. Wright, D.F.C.; Commander G. E. H. W. Wrigg Walker; Professor G. P. Duthie, Q.H.F.; Professor John Linstead; Professor E. W. Read, C.H., F.R.C.; Professor A. N. Wilkinson; Professor R. Wooster, F.R.C.; Surgeon Commander G. A. Form; Surgeon Commander W. A. Hartree; Surgeon Commander G. G. Hopkins, Q.H.F.; Surgeon Commander W. B. Jones; Surgeon Commander W. M. Dunstan, Q.H.F.; Surgeon Commander D.S.C. W. I. M. Turner; Surgeon Commander T. W. Flanagan, Q.H.F.; Surgeon Commander J. Green, Q.H.F.; Surgeon Commander W. H. C. M. Harbord; Surgeon Commander G. S. Jones; Surgeon Commander H. G. P. Lewis, M.A.R.; Surgeon Commander C. L. T. MacLellan; Surgeon Commander F. Ward Morris, Q.H.F.; Surgeon Commander R. V. May; Surgeon Commander P. Mayall; Surgeon Commander P. O'Brien; Surgeon Commander R. J. O'Donnell; Surgeon Commander J. S. Parker; Surgeon Commander M. O. S. Parkes; Surgeon Commander A. M. Rutherford; Surgeon Commander L. P. Spur; Surgeon Commander D.W. P. Sudlow; Surgeon Commander T. A. Taitson; Surgeon Commander L. O. H. Li Ulita; Surgeon Commander R. Weston; Surgeon Lieutenant A. P. Gorham; Surgeon Lieutenant J. B. Lawrence; Surgeon Captain W. H. Lylekay, U.S.N.; C. H. MCNEIL; S. J. McNamee; A. W. Radford; M. S. Ratcliffe; A. J. W. Reid; D. REED; H. Rossiter; A. Rungby; Surgeon P. J. A. Rusler; P. G. B. Sampson; R. L. Somay; F. COX, F.C.W.; Dr. J. Charles; G. Chisholm; Captain, W. F.

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 R. C. Wykes

A programme of these was provided by the Officers of H.M. Royal Marines (Portsmouth Group) under the direction of Captain R. A. McLean,
 M.B.E. L.R.A.M.

The Toast of The Royal Navy Medical Club was proposed by Sir Cyril May who in his summary of the events since the last Annual Dinner remarked on the publication of the Report of the Select Committee of the Estimates in which delegation of the Royal Naval and Dental Services had been recommended. Expressing his surprise at the evidence of witnesses had unanimously supported this proposal which had been backed and repeated by the Warship Committee five years before, Sir Cyril's unflinching opinion was that all the Service Departments are equally confident that the recommendations would again be accepted this happened in the past from time to time over the last twenty to thirty years.

Referring to the transfer of the Royal Naval Hospital Hong Kong, to the Army Sir Cyril mentioned that it was some consolation that the Navy would be taking over the small hospital in Mauritius in June 1960. It also seemed certain that in 1962 there would be only one Service hospital in Malta and that Jersey would be selected and would be run by the Navy.

Sir Cyril was happy to report that our members of Medical and Dental

Officers were up to full strength so that there had been no necessity to draw on Naval Reserve Officers for the last three years. The current situation for both Specialist and non-Specialist Officers was most unsatisfactory and a hopeful sign for the future was that there are waiting lists in both the Medical and Dental Branches for transfer to the Permanent List. The number of officers obtaining higher degrees and qualifications had been most gratifying and included 1 F.R.C.S., 1 M.D., 1 F.D.R., and 9 Diplomas of various kinds.

Congratulating Sir James Parkinson Ross upon his elevation to a baronetcy, Sir Cyril expressed his gratitude to Sir James and to the Council of the Royal College of Surgeons of England for again permitting the Club to hold its Cricket Party at the College.

After commending a number of Medical and Dental Officers who had received Honours and Awards, Sir Cyril announced the institution of the Errol Edmiston Prize valued at approximately £100 annually.

Ending on a personal note, Sir Cyril May expressed his sadness that the occasion was his last night in the Navy before his retirement. He wished to thank the Medical and Dental Officers of the Royal Navy and the Royal Naval Reserve, the members of the Nursing Services, the Civil Consultants and also his personal Staff in the Medical Department, for their support and co-operation during his term of office and he wished success to Surgeon Rear-Admiral W. H. B. Penderidge who would be taking his place as Medical Director-General and who, Sir Cyril well knew, would receive from all quarters the unfailing help upon which Sir Cyril himself had always been able to count.

Reviewed

A Handbook of Diseases of the Hand. By Herbert G. Monks. M.B.C.S., F.R.C.S. Edinburgh. Pp. 224 with 100 Illustrations. Demy-C. J. Falmer Limited. Price 5s. id.

Although at the preface of this book the author states that it is intended primarily for students there are several points which will recommend it especially to those who permanently make a considerable book for the undergraduate and the general practitioner having no wider knowledge of the specimen.

Firstly an attempt has been made to set forth the necessary preparatory conditions. Very many of those described go so far that it is more difficult that the average surgeon will never come down during the whole of his career fit alone for student work. Then the only suitable self-teaching book.

The result of this treatment is however an disadvantage. The problem of poor quality photographs all in black and white would make the task of establishing a diagnosis very difficult for the beginner. Why for instance would black and white photos on showing a flexed thumb (pp. 92 fig. 22) Transverse of Clavus (fig. 21) or Paganini's Flexor Palmaris (fig. 46 and 47) when the only other feature are the associated tendons? There are also a very number of clinical electrical pictures of non-specific examinations which could not be due to various places, joint contracture, etc. etc.

Again, as a book of this type is one hardly helps the student to certain technological distinctions, or photographs might showing the patient *Hanging* of things!

The book therefore is by no means confined to or fit for use in the Dermatologist but can rightly be said enough to be of value as a practical aid in the management of diseases and lesions. The only really amateur feature is the quite remarkable price which makes the book in view of all the 100 illustrations well fit to a good boy for the medical officer who fails that the audience cannot simply to take in one of the many better but unfortunately much more expensive volumes on Hand.

E. W. B. S.

Handbook of Diseases of Anatomy and Human Structure. By E. R. Knob C.M.G. M.R.C.S. F.R.C.S. and A. E. McIndoe M.S. F.R.C.S. FR.A.C.R. Second Edition. Pp. vi+124 with 127 illustrations. Edinburgh and London. E. & S. Livingstone Limited. Price 5s. Half-bound £1. 10s.

In the everyday practice of work and play few parts of the body are of more importance to us than our hands, and few parts of the body are more vulnerable to injury both at work and in the home.

An increasing volume of these facts has led to a good deal of work being done on the application of the principles of plastic surgery to the treatment of hand injuries. The authors acknowledge their debt to the teachings of Sir Harold Gill from the knowledge of whom the value of which will probably be found in its analytical approach and in learning Knobell and Savory Knob, who have shown the possibility of repairing surgery of the hand.

Mr. Rank and Mr. Swindell have in their book presented a most interesting addition to the literature on the treatment of head injuries. This is probably unique in its extensive clinical background both in England and Australia and has, given as their practical importance in writing this book, casting on the highest standards throughout and emphasising the importance of good primary surveys in determining the patient's result. The authors' belief of primary importance is all that is visualised and can be, there is a less dominating need for secondary important procedures and extensive complications become an unnecessary reality.

Although the emphasis is on primary treatment, chapters are included on every aspect of the head, encompassing and appraising of a mainly regional head, the external skin and bony structures of the head injured and the management of brain.

The book is simply written and beautifully illustrated. It contains lessons for every person who has to deal with head injuries.

J. W. W.

PRACTICAL RHEUMATOLOGY AND PHYSIOTHERAPY. By Miss Eileen George, M.R.C.P. (Editor). Classified by Dr. G. H. Lee (see drawings). London: Pitman and Peter Lamond. Price £1.6s. 6d.

This book covers a wide and complete field of treatments by physiotherapy and will be invaluable to physiotherapists at low levels and to necessary details on the techniques of application of the numerous treatments available. This should prove to be of great benefit to the qualified physiotherapist as it is the analogous emphasis has been placed on safety measures for the clinical physiotherapist. The diagrams are numerous, clear and informative. The chapter on long bone fractures should prove a useful addition especially for new students and recently qualified physiotherapists.

Clinical Therapeutics. By C. J. Peltier, M.R.C.P., F.R.C.P., M.R.C.S., of the Inner Temple, Secretary of the Royal Society of Medicine, D.M.R.C., M.D.(Lond.), F.R.C.P. (Ed.), F.R.C.S. London: English University Press. Price 4s. 6d. net.

Professor Peltier and Dr. Thompson have here produced an outstanding work which is intended primarily to describe the physical features of diseases in the human. Behavioural, postural and neurological features are equally wherever possible. In the same way the range of the subject has been extended to the commoner processes of life as pain, rest and sedation processes in the expression and of practical importance. The various systems are covered clearly and well and should interest both medical students and junior doctors on a valuable physiological basis.

The chapter on painless by infection is of the greatest interest, and the account by one of our leading radiologists may be expected to make of lasting value to the diagnosis of the condition. The official terms proposed by the Joint Committee of Definitions produced by the meeting, convened by the Radiological Society, adequately covered and a welcome loss in nomenclature of the present time. Altogether this is an excellent work for which the author merit our gratitude and congratulations.

J. L. S. C.

A Short History of Nursing. By W. R. Bell, M.R.C.S., L.R.C.P., F.R.S.L., F.R.A.S. (pp. 179 with 11 line drawings in the text). London: Pitman and Peter Lamond. Price 12s. 6d.

I found this small book most interesting and I am sure that all nurses will enjoy reading it and have much from it.

In the section on Queen Victoria I am sorry that no mention was made of Mrs. Shand-Taylor who is an ancestor and not to Wharton in 1853 to care for sick and wounded sailors on the Crimea.

Altogether a most readable book.

J. M. W.

Hypnotic in Medicine. By *Albert Maudsley*, M.D., M.R.C.P., D.P.M. (First Edition, Pp. 162.) London: Longman & Co. Ltd. Price, 15/- net.

Dr. Maudsley's *Memoirs* contain the history of hypnotism in England from the days when it was first adopted in medicine. It tells a story which interest from the acceptance of the frequency of psychosomatic disorders in general practice and Dr. Maudsley's long and eminent psychiatric career has definitely changed from 15 years ago when he completed his book.

Despite the obvious emphasis by a medical practitioner that hypnotism is by no means a psychosomatic treatment and in these premises any semblance of a medical fit illustrates the history of hypnotism its indications and hazards. The selection of suitable patients and the results which may be expected, pointing out that except in relatively rare instances hypnotic suggestion alone has no power over a normal therapeutic effect. He discusses how difficult hypnotism can be when used as a method of strict analytical psychotherapy, because many patients, although over deeply repressed neuroses and other maladies of psychology. One section is devoted by Dr. Maudsley to graphical records of several of his patients.

Consequently this book is directed to the group of physicians who use hypnotic techniques and methods of convincing patients efficiency in carrying out hypnotic work. No probably those concerned are very familiar the staff, his or their other medical appointments may not be mentioned only by passing. The material presented provides an adequate foundation for any article to begin hypnosis.

From the Sleep Thought of *James Elmer* through the medical Sleep of the *French* and the *American* *Magnifying* of *Marion* to the work of *Bard* and *Edwards* who unlike Dr. Maudsley had no refuge from the staff of University College Hospital on account of his cases, hypnotism has had no refuge. Now ruled by the Act of 1922 which prohibited public demonstrations and by the several resolutions of P.M. of the British Medical Association, it has gone to jail. No no practitioner like book may lawfully risk serving the clause.

G. C. W.

Practical Medicine. By A. Keast Moore (M.D.Lond.) (Pp. viii + 262 with 118 Figures. London: Lloyd-Lane Limited. Price, 25/- net).

Dr. Moore has produced for us a new book which gives us how to practise medicine and our observations should we ever be confronted with a case of sudden death. Without neglecting the unexpurgated doctor I am told in the book could easily make mistakes. Dr. Moore writes in an easy manner and his writing is well suited to an age when death by violence seems more to be mysterious to the lay man as to any field previously involved predominantly without mystery. The various parts of the subject are set out in good detail and followed throughout by photographs which are excellent in their conception. Dr. Moore tries to be unengaged upon a task which is continuing in every possible way.

J. S. H. C.

How Green is the Grass! Diet Instruction, Recipe, and other Guidance Based on "A Dietetic Handbook as used in the Chelsea Clinic of the London Royal Infirmary." First Edition. First published 1920. By M. London, B.Sc. and Son. £1.5s. French.

The small inexpensive booklet which has just been published will prove to be most valuable for guidance in all dietary problems prior to their discharge from hospital following their initial admission. It is basically nothing more than a glorified pamphlet, but it contains seven pages of advice, very good for the digestion, self management, following the diet as to be found from 12 individualized allowances, food values and a book with low caloric value, copies for 30 grams protein and meat, specimen lists of varying caloric values between 1,000-kilocalories and 1,200 kilocalories.

It is essential, however, that all derivative processes of synthesis or higher synthesis, which may be used, must be based on the synthesis of their starting materials as described in the accompanying tables. The term "Homo-Cladyl" is the most brief and easily referenced. The last letter should be used at the lowest point of greatest precision to indicate changes in terms of the various syntheses, the various salts and concentrations of the reaction, details of synthesis, the expression of substances, as well as resolution of identity of the substitution and other relevant changes, although generally a separate page is devoted to the use of these terms. Different synthesis routes of course should have nothing in common.

Representatives from both partners will be invited once invited to implement the patient's treatment plan in accordance with their individual responsibilities relating to their clinical expertise.

L T

Brachynemurus Tenuirostris (Faxon) *Solenites armatus* - By
John A. McDaniel, M.D., FR.A.C.P. (F.R.C.P. Canada), Consultant Physician
Surgery, Oregon Road Hospital, 1st edition, Pg. 100, 100 with illustrations.
Illustrations and Figures, 1-6, 1-10, Illustration 1-10, Figure 10.

Unite so many other mad politicians. The chief trait with this body goes to his lawyer. The author has indeed filed a complaint with the chief publication on the treatment of journalists with particular reference to their social and types of job names down.

The work is well written and exceptionally lucid and descriptive. It is divided into parts. The first part of roughly 100 pages deals with the basic techniques of plastic surgery. This makes the book thus, direct in form and practical principles which can be easily assimilated can be digested much less than 40 years knowledge of Roedel. The second part of the work deals with the original application of these basic principles and techniques. General Plastic Surgery, Burns and Surgery and Surgery of the Ear.

This book is unquestionably a most valuable work on the principles of plant ecology and should prove beneficial to all workers who have to deal with them. It is extremely difficult to say that the author has reduced the discipline to a science and probably does somewhat injustice, but it is fair to say that in its completeness the book might well be said to have made definite descriptions of general processes, techniques and procedures.

This book should be studied in the library of your college, also in any library connected with the principles of Foster Society and who may be found with the assistance and knowledge of the author.

三

MOTOR, THREE-SPINDLE 1000 Used by Sir Gail Whitley Bt. A.R.A., C.B.
11-12 W.H.D. FREE FREE PELA PACE PACE By
J.W. BROWN with 20 plates and other illustrations. London: National Press (London).
1901. D. 12mo. Price 10s. Postage 3d.

This well known textbook has now been published for French-speaking students, will be familiar to many English officers. Designed to keep the professorship interested in the practical application of the Latin materials and to provide an unusual reference source in the Latin-speaking countries of Europe and beyond, it includes mathematical angles by some of the foremost physicians and surgeons of the country. The subjects discussed have been thoroughly tested and are the results of hundred of experiments.

This edition maintains the high standard of its predecessors and includes enough extra material to cover all the basic knowledge of marine law required by the present-day practitioner and student. It clearly states issues of the most recent litigation that have arisen in disputes, the management of insurance risks and the navigation and placement of oilfield assets.

10

Mr. Edward H. By John Winston First Edition Sept. 1962 Pp. 250 Lincoln, Nebraska

Now John Weston likes lots of things you will consider! He had the pleasure of reviewing your first novel which we greatly enjoyed. His work on *Kidd* may feel slightly dated (and it may need some) but I suspect anything from the author would be welcome as you spent a good deal of time on it.

Help Save Our Seas—We can't afford to wait for someone else to make the decision. The publicists of course do whatever they please in their own self-interest, only for the climate change lobby, which turned the internet green page, an ocean-wide a coalition of climate change advocates.

We had no trouble however in the subsequent disposal of the two mobile passengers of whom we could make nothing out. We left the Mary, however, the day before the departure of the rest of the crew in their little boat. What is to say is that they had dinner there had been no communication with our boat of human character. Indeed, I think who came over to the steamer long before the end of the trip. It is to say on the contrary as indeed it must have been in the Mary, when the author described that I was particularly absent with a very strong desire induced him, should be placed on the Board of Enquiry.

John Wilson has recently obtained you some small light and fast no-pause or local
or no-thrust but high speed. This being so far best gun will now be utilized by
the naval forces after no previous efforts can be made.

It's been a year since you've last written me and I am impressed more than your superb writing. I really enjoyed reading it so I believe that the suggestions at that point did not change anything at all. Could it possibly be that your Agents and Publishers have caused you into your muted silence before you are fully ready? This question I know only too well in the light of long experience. That basic concern for writers is a curse to us men and women. Should one ever be forced to write, one should always do it alone in a field where no prior literary references and the like are of any real significance. Above all, never let the temptation to join those well-organized literary groups or the corresponding writing societies. The most dangerous of these societies used to be Paris. If you have to force yourself to write when not positively provoked (which I do) you have to say this about myself: "If he writes now, maybe not thinking about you will feel bad, but as soon as some poor fellow comes and will find him from your related shortcomings. And our family at home will think that we have no depth when we're not need."

JLRC

With the exception of the first two, all the remaining publications were written by men.

Obituary of the Members

OBITUARY

Sergeant Captain B. G. DRAKE-MANN, D.S.O., R.A.M.C. (Rtd.) died on the 1st December 1965. Born on the 26th July 1912, he qualified M.B. Ch.B. University of Oxford in 1936. He entered the Royal Naval Medical Service as a Surgeon Sub-lieutenant on the 11th May 1937. He was promoted Sergeant Lieutenant Commander 1943 May 1945, and Surgeon Commander on 1st May 1949 and was placed on the Reserve list (age) with the rank of Surgeon Captain on 27th April 1953.

Sergeant Captain Drake-Mann was awarded the D.S.O. on the 2nd January 1945. He was recalled on the 1st December 1953 and entered at the Royal List on 20th October 1954.

Sergeant Captain A. C. FARNHAM (Rtd.) died on 1st November 1960. Born on the 11th August 1910, he qualified M.B. Ch.B. on 18th February 1938.

An intermediate Royal Naval Medical Service 1938-1940, he became Surgeon Lieutenant. He was promoted Surgeon Lieutenant Commander on the 15th May 1947, and Surgeon Commander on the 1st May 1951. He was placed on the Reserve list (age) with rank of Sergeant Captain on 15th August 1960, and subsequently served until his final retirement on 1st December 1965.

Sergeant Commander B. A. P. HAWKINS, R.N. died on the 22nd January 1960. Born on the 5th May 1912, he qualified M.B. Ch.B. at Keele University (Manchester) 1937.

He entered the R.N.V.R. on 1st March 1938 as a Temporary Surgeon Lieutenant and transferred to the permanent list on 1st January 1940 at the rank of Surgeon Lieutenant Commander. He was granted the rank of Acting Senior Surgeon Commander on the 12th March 1948 and promoted to Surgeon Commander on the 1st December 1954.

Sergeant Commander Hawkins was serving H.M.S. *Dartmouth* at the time of his death.

Miss E. M. O'NEILL-ADAMS (R.A.C. Superannuating Sister Q.A.W.M.W.R.) died in the Royal Naval Hospital, Haslar on 5th February 1960. A Memorial Service was held in St. John's Church, Haslar on 10th February.

R.M.W. writes:

The news of the death of Sister O'Neill-Adams was received with much regret at Seafarers Royal Naval College, Dartmouth. She had been the Senior of the last batch of Sisters to enter in the hospital before a closed class in December 1959.

Appreciations of her have been expressed by Officer, Nurses, their wives and by the staff who served under her.

Before leaving the Royal States, were closed by the Wardroom and Miss O'Neill-Adams' speech on this occasion is still remembered by those who were there on the day.

"The Captain on the sailing of the *Seafarers* comes as a memory of that creation and of her."

MEMORIAL AND APPOINTMENTS

Comptroller John M. M. Macmillan, D.S.O. of the Royal Surgeons Royal Admiralty (R.A.C. / Pensions Q.H.Q.M.W.R.)

HIGHER DEGREES

F.R.C.S. Eng.—Sergeant Captain F. L. S. Coulter—by election
M.Ch.B.Med.—Surgeon Captain D. P. Ward

W.D.H. Ladd—Surgeon Lieutenant H. B. Mallon
 D.O.—Surgeon Commander T. C. Brown
 D.O.—Surgeon Lieutenant Commander H. J. Hart
 F.D.S.—Surgeon Lieutenant Commander (D.A.) F. J. Baer

PROMOTIONS

To Surgeon Major General—R. V. Bush (R.C.F.) (1940)
 To Surgeon Lieutenant Colonel—D. A. C. Walker (1938); R. V. Wilson (1940);
 J. M. Green (1941); D. Washington (1940)

ENTRIES FOR SHORT SERVICE COMMISSION

C. J. Beckwith; M.B., B.Ch., F.T. Beach; M.B., B.Sc., M.R.C.S., L.R.C.P.; H. E. Black
 M.B., Ch.B., F.T. Blackmore; M.B., B.Sc., F.R.C.S., L.R.C.P.; H. S. Broadbent; M.B.,
 B.C.M., M.R.C.S., L.R.C.P.; J. M. D. Collyer; M.B., B.Sc., D. W. D'Alton; M.B.,
 B.Sc., C. J. Dunn; M.B., B.Sc., M.R.C.S., L.R.C.P.; D. G. Evans; A. H. Head; M.B.,
 B.Sc., J. T. Heron; M.B., B.Sc., M.R.C.S., L.R.C.P.; D. J. Hart; M.B., B.C.M., M.R.C.S.,
 L.R.C.P.; A. S. Hayes; M.B., B.Sc., L. T. Jones; M.B., B.Sc., G. A. Lampard;
 M.B., B.C.M., M.R.C.S., L.R.C.P.; C. J. M. Maxwell; M.B., B.C.M., L.R.C.P.;
 R. S. Morrison; M.B., B.Sc.; R. J. Mycock; M.B., B.Sc.; I. Mycock; M.B., B.Sc.;
 J. J. O'Brien; M.B., B.Sc.; A. J. Parker; M.B., B.Sc., M.R.C.S., L.R.C.P.; A. J. Pen;
 M.B., B.C.M., A. E. Rampling; M.R.C.S., L.R.C.P.; J. P. Scott; M.B., B.Sc., W. Weston;
 M.B., B.Sc., M.R.C.S., L.R.C.P.; G. T. Wilson; M.B., B.Sc., M.R.C.S., L.R.C.P.;
 B. Lupton; I.D.S.; B. R. O'Brien; F.D.S.; I.D.S.; J. W. G. Folger; B.D.S.; I.D.S.;
 D. B. White; L.D.S.

RETIREMENTS

Surgeon Captain C. H. J. Jones
 Surgeon Commander G. A. E. Anthony
 Surgeon Commander (D.A.) E. W. King Taylor

WARDENMASTER OFFICERS

PROMOTIONS

To Acting Wardenmaster Grade Lieutenant—R. F. Ford; S.E.P.O.; H. Hartman; S.E.C.P.O.
 R. A. Jackson; S.E.C.P.O.

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

PROMOTIONS

To Superintendent Nurse—Miss E. Carter (1938); Miss E. T. M. Hartman (1937-40);
 Miss R. Scott; A.R.N.C. (1939);
 To Nurse Nursing Sister—Miss F. D. Doyle (1938); Miss F. G. Laidlow (1939); Miss
 A. D. Marchant (1938); Miss E. M. Newberry (1938).

ENTRIES FOR SHORT SERVICE

Miss J. Miles; R. S. Norcott; F. M. Scott; J. M. Thomas; F. C. Thompson; M. Wilson;
 F. A. Wright

TRANSFERS TO SHORT SERVICE COMMISSION

Miss H. P. Chown; Senior Nursing Sister; J. M. Clark; Nursing Sister; A. D. Marchant;
 Nursing Sister; D. M. Walker; Nursing Sister

RETIREMENTS

Miss D. A. Cawley; Nursing Sister (1937-40)

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING AUXILIARY OFFICERS

Miss E. C. Buckley; A.R.N.C.; Moral Nursing Assistant, Officer (1938);
 Miss F. D. Parker; A.R.N.C.; Moral Nursing Assistant Officer (1938)

NAVAL MEDICAL COMPASSIONATE FUND

ACCOUNT OF RECEIPTS AND PAYMENTS FOR THE YEAR ENDING 31st DECEMBER, 1959

	£	s	£	s	£	s
Balances at Bank on 31st December, 1958						
Bank						
Current Account	261 14 0					
Deposit Account	203 8 1					
	<hr/>					
Dividend on 2½% Consolidated Stock						
Interest on 4½% Consols Stock	263 8 0					
Interest on 4½% Consolidated Stock	263 8 0					
Interest on 1½% War Stock	23 8 0					
Interest on 4½% British Consols	263 8 0					
Interest on 4½% British Consols	263 8 0					
Interest on 1½% War Stock	23 8 0					
Interest on 4½% British Consols	263 8 0					
Interest on 1½% Pending Loan	70 14 0					
Total Dividends	263 18 0					
	<hr/>					
Interest on Deposit Account			803 1 0			
Subscriptions			11 9 0			
Donations			348 17 0			
	<hr/>					
	£ 1,112 14 0					
	<hr/>					
	£ 1,112 14 0					

I certify that I have examined the above Accounts of Receipts and Payments and that it is correct and in accordance with the books and records of the Fund and that all my representations to Auditors have been made.

A comparison of the Balances on Current and Deposit Accounts on the Previous Financial Year, April 1st to March 31st, 1958, is shown below together with a list of Stocks outstanding at the end of the Trustee's last full financial year held by the National Provincial Bank Limited for safe keeping.

The figure of £112,14s.0d. on Current Account includes the sum of £144s.0d. being investment on account of the Disposal Fund.

Subscriptions received during the year include £1,112.14s.0d. paid in advance for 1960.

Subscriptions unpaid at 31st December, 1959 amounted to £1,112.14s.0d. as follows:

1960	£ 1 0
1959	£ 1 0
	<hr/>
	£ 1 0

(Signed) Wm. C. McLean, Chartered Accountant
2nd February, 1960
Author

Interest on War Stock and Deposits	433 0 0
Capital Account	30 0 0
Salaries	1 0 0
Interest Received from on Death of G. C. Green	2 00 0
Subscriptions received and returned	0 0 0
Holder Stamp	0 0 0
Stocks and Bond Tax Stamp	0 0 0
Interest on Bank on 31st December	0 0 0
Deposit Account	263 12 0
Current Account	203 18 0

£ 1,112 14 0

In addition to the above Cash Balance Stock in the following amounts were standing in my name at the Bank of England at the time of the Trustee's

£ 1,000	2½% Consolidated Stock
£ 1,000	4½% Consols Stock
£ 1,000	4½% Consolidated Stock
£ 1,000	1½% War Stock
£ 1,000	British Electricity Stock 1959/70
£ 1,000	£ 1,000 100% Pending Loan 1960/2004

Disposal Fund under Clause 2 of the Order in Council of 26th July, 1951
Received out of accumulated money and subscriptions

Sgt. M. P. McLean
Reserve Bank Advisor
Ministry Finance
2nd January, 1960

ADMIRALTY PLEIT (CONT'D)—1944

(See also *Armed Forces* for other personnel)

- 287—*Admiralty Reparations*—Q.A.B. M.H.S.—Naval Nursing Auxiliary Service.
- 288—*Admiralty*—Q.A.B. M.H.S.—Naval Nursing Auxiliaries, Berlin, Berlin Ostkreis, Tropical Berlin, Oberhavel and West Berlin, Pomerania.
- 289—*Admiralty*—S.M. Hospital, Hong Kong—Trials of Responsibility to Army.
- 290—*Admiralty*—Officers—Medical Aspects of Warship Warfare—January to July, 1944.
- 291—*Admiralty*—Reciprocal Agreement on Medical and Dental Treatment with the German Armed Forces and Pakistan.
- 292—*Admiralty* or *British Ordnance*—Syringe discovered within two days of joining the Service.
- 293—*Admiralty*—Commodores—Pilots' Assistance.
- 294—*Admiralty Ships*—General Equipment—New Instrument Cleaning Theatre Light Fitting—Introduction.
- 295—*Admiralty*—Maintenance of Ammunition Apparatus.
- 296—*Admiralty Ships*—Auxiliaries—R.F.P.C.T.H.
- 297—*Air*—The Aerodrome Fund and Fund.
- 298—*Air* and *Admiralty*—P.M. Code, 1944—Officers R.N. and R.M., Ratings R.N., Other Ranks R.M., W.R.N. & Radios Q.A.B. M.H.S.—Naval Nursing Auxiliaries and Rating Members of Voluntary and Unconnected.
- 299—*Airforce*—Formation of new Personnel.
- 300—*Airforce* in Civilian Personnel.
- 301—*Examination*—Personnel Not-Educated—Results.
- 302—*Airforce*, Hospital and Dental Treatment in Naval Facilities Abroad.
- 303—*Airforce* and *Dental Stores*—Amphibian Apparatus Held—Report.
- 304—*Airforce*—P.M. Code 1944—Sergeant Captain.
- 305—*Burgess* and *Agents*.
- 306—*Medical*—T.A.B. Instructions.
- 307—*Pilot*—The Aerodrome Fund.

Editor

The Editor invites medical officers to send in original papers on pharmaceutical subjects and personal experiences. The Journal of new and original research on the pharmaceutical service will be enhanced from day to day by contributions on Home and Foreign authors. Notices of births, marriages and deaths are accepted free of charge to subscribers.

All articles or communications published in the Journal, or the Royal Pharmaceutical Society will become the property of the Journal with full copyright given, unless the author desires otherwise when sending in the article that he retains the copyright in himself.

The standard system should be employed for bibliographical references, these references being arranged in alphabetical order of the authors' names at the end of the contributions, *Brit. Med. J.* (1911) *J. Roy. Soc. Med.* 22, 23. In the text a reference to a publication should be quoted by giving the author and, in brackets, the date thus: "Smith (1911) believed that in his day, etc."

The Journal is published quarterly, four numbers comprising one volume.

Articles and communications may be sent to the Editor at any time. They should be clearly written in, preferably, typed and sent in duplicate to The Editor, R.P.S. Medical Library, Aberdeen, Scotland.

Subscriptions

For R.M. and R.N.V.R. medical personnel on the rates of stated fee, and for Contractors to the Royal Navy the subscription is £10. per annum (postage included) payable in 1st January of each year. Single copies £1.

For medical officers in the above categories the subscription is £10. per annum (postage included). Single copies £1.

For all others who are not in the above categories the subscription is £10. per annum (postage included), or £10. per single copy.

Cheques and postal orders should be issued to Lloyd's Bank Ltd¹ and made payable to the Editor, The Journal of the R.P.S. Medical Service.

The payment of subscription by banker's order is recommended as it enables the subscriber of the money of increasing a deposit each year and simplifies the keeping of accounts.

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THE EDITOR

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R.P.S. Medical Library, Aberdeen, Scotland.

Journal

of the

Royal Naval Medical Service

PUBLISHED QUARTERLY

(The Admiralty do not accept responsibility for the opinions expressed in this Journal)

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EDWARD H.

THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL,
ALVERSTON, HAMPSHIRE



Editorial

**THE R.M.A.'S SCIENTIFIC EXHIBITION, TORQUAY 1960
THE ROYAL NAVY'S CONTRIBUTION**

III

Sergeant-Captain S. WELPS, R.N.

In June 1960 the British Medical Association held its annual conference at Torquay and as usual the Royal Naval Medical Service was invited to contribute to the Scientific Exhibitions.

The Control of Tuberculosis in the Royal Navy had been chosen as a subject for demonstration. Tuberculosis has always been regarded as a traditional disease of service and has remained high on the list of prevailing causes in the Royal Navy.

Research was presented covering a period of fifty years and the central theme of the demonstration was a pair of scales representing the balance between predisposing and controlling factors. The pointer of the scales showed the present incidence rate, a little over 1 per 1000 strength per year. In one pan were weights chosen in size to represent the adverse effects of such factors as overcrowding, rheumatic virus, increased time below deck, the migration of men with machinery for living space and drug resistance etc. In the other pan are the same scale weights represented improved diagnosis, treatment, and selection, better food, improvements in habitability and B.C.G. inoculation. Indicating tapes from the weighing to photographs of short descriptive notes outlining their significance and a flimsy rather heavy weight key on the hook to represent the increase in adverse factors which the outbreak of war could bring.

A number of slides briefly outlined historical ward used to illustrate changes in incidence over the years and the reasons, so mass radiography and B.C.G. two major advances in the control of tuberculosis which in this country were presented by the Royal Navy.

In fifty years the incidence rate was shown to have dropped from 2 per 1000 per year to a little over 1 per 1000 per year. In considering this fall, which at first looks disappointing, it should be remembered that fifty years ago cases were well advanced before being diagnosed and left the service to die or live as chronic invalids. Today cases are diagnosed and treated with minimal lesions, invariably with a prospect of recovery and a useful life ahead.



The importance of this technology has been witnessed mainly by a long-term increase in diagnostic mammography (from 1940) and a rapid decline in mammographic mortality. A remarkable feature, which occurred at the same time, was a small but significant peak up rate on the charts from 1940 to 1950 (see the lower film in the upper photograph), which took place in 1950.

In 1950 the basic model is still B.C. in association for key extracts when there is bilateral negative. There is no reason to doubt statistically that this is so.

Other interesting records showed the impact of the more recent national B.C. Campaign on the Mammogram results of breast cancer, which was a small percentage of apparent field conversions, and a chart comparing rates of mammogram detection with subsequent tuberculosis prevalence. This supported the generally accepted belief that a large infection induced a greater risk of subsequent development of disease.

More practical exhibits included moving films showing a series of mammogram radiographs leading to a final pick-up reproduced on a large film and transparencies and a series of colour transparencies showing the Navy's method of monitoring the use of a Mammogram reader by means of a Perthes disc with a



series of performances of appropriate music. This method is considered superior to the more conventional one using slides.

Though the incidence of tuberculosis in the Navy has over the past been greatly reduced, the figures published by the Registrar-General and other investigations show it still to be higher than comparable groups in civilian life and the other services. There is no room therefore for complacency and with the future role of the Navy likely to strengthen greater confinement of men below decks and more time completely submerged, the control of tuberculosis must remain an important responsibility of the Naval Medical Service.

The social committee arranged many visitors during the week, including several consultants in chest diseases and specialists in tuberculosis, whose criticism and advice were welcomed. A large photograph of H.M.S. *Torquay* was greatly appreciated by the local residents but the highlight of the week, was the visit of H.R.H. the Duke of Edinburgh, who showed considerable interest in the Navy's problem. The President of the R.M.A. (Sir Arthur Purnell), also paid a formal visit.

An interval with the British Medical Association's annual meeting, in addition to a valuable series of lectures and discussions on various current medical problems, there was a formidable social programme. This gave a welcome opportunity for Service Medical Officers to meet their opposite numbers in civilian life.

An association this year was a lunch party arranged by Doctor H. George B. Delisle CBE for past and present officers of the Royal Naval Medical Service (R.N., R.M.R., R.N.V.R., and Commonwealth Navies).

The chair was taken by Dr. Delisle Gage and a short address was given by Mr. Lawrence Abel, Serving Officer from Dartmouth, Plymouth and the Medical School attended as well as a number of naval doctors. Although there were only 26 present the occasion was most successful and it is hoped that such a lunch will become a regular feature of the Annual B.M.A. Meeting.

The Party's demonstration was organized by the Royal Naval Medical School, but it could not have achieved its undoubted success without the help of the medical officers in charge of the Mass Radiography Unit and also Surgeon Captain J. Lunn, Surgeon Captain N. B. Hepburn and Surgeon Commander K. J. O'Connor.

REPORT OF A PILOT TRIAL OF A NEW DRUG (SLEP 5194A) IN THE TREATMENT OF CHRONIC SCHIZOPHRENIA

Major Commander Wm CULLIN, RN

AND

A. LEITCH

Consultant Psychiatrist, Barrow Hospital, Devon¹

SLEP 5194 is a phenothiazine derivative with the chemical formula 1-(4-dimethylamino-2-methylpropyl)2-(dichloromethyl)phenothiazine HCl and structure as below:



It is a white crystalline powder with a bitter taste, has dampening properties, with melting point ranges of 170 to 173°C and 181 to 183°C, and is very soluble in water.

Laboratory research has shown it to be in comparison with chlorpromazine—

- (1) Five times as effective in blocking the conditioned escape response in rats.
- (2) Three as effective in suppressing major anxiety.
- (3) Ten times as effective in its antihistamine activity.
- (4) Three times as effective in its anticholinesterase activity.

These laboratory results suggested that in the clinical field the scope of use for SLEP 5194 is the same as that of chlorpromazine, that it could be used in smaller doses, and that it should produce fewer side effects.

PLANNING OF THE TRIAL

An knowledge of this drug seemed to be quite limited—South African and French, like manufacturers concerned have reported a series of 24 cases in their literature on the drug and Guyuron, Cohen and Molko (1959) have reported on a further 18 cases. It was decided at the beginning of the clinical trial to use initially two groups consisting each of 6 long-stay patients suffering from schizophrenia, 4 female, and to control these groups by detailed clinical observation and extensive laboratory investigation.

It was decided following the initial phase of the trial to widen the scope of treatment and to treat a substantial number of patients if the initial impression of the drug warranted this.

The results obtained in these 12 persons however were not encouraging and as it was learned in the course of the trial that the drug would not become generally available for the treatment of patients, the second phase of the trial was not undertaken.

It was felt however that it ought to be given the findings of the
inquest and the present report has therefore been prepared.

Volume 12 Number

All the 10 patients in the present study are males whose ages range from 40 to 70 years, and whose average age is 51 years. They are all long-term patients suffering from schizophrenia; three who have been in hospital care for many years (both in the hospital and elsewhere) who have been adequately treated in the past by electroconvulsive therapy, insulin coma treatment, drug therapy, including chlorpromazine, and who have failed to show any further response to these various treatments.

Centre of the Tsar

The trial was begun in the autumn of 1939 and continued until January 1940.

The initial dosage of the drug was 6 mg. per day given in 3 equal doses spaced throughout the day. The dosage was slowly increased in a noncumulative manner to a total of 60 mg. per day and then subsequently adjusted as the clinical response of the patient seemed to indicate. The maximum dosage used was 80 mg. per day.

At the conclusion of the trial the dosage was reduced to a quarter-mugay dose. The patient had one of the doses during the first week of the trial.

It was eventually discontinued at the end of January in all except 3 patients who continued to have diarrhoea. Of the 3, two were asymptomatic.

Let these stories move you to action and the desire to make a difference.

JOURNAL OF CLIMATE

The following sections have been added to the following:

- (c) Liver Function Tests

 - Evaluation of Serum Proteins (Total and Differential)
 - Evaluation of Bilirubin
 - Evaluation of Thyroid Function
 - Evaluation of Alkaline Phosphatase
 - Evaluation of P C V
 - Evaluation of Hb
 - Evaluation of white cells—both total number and differential count

(d) Routine examination of urine for protein and bile pigments and also the routine examination of the stool to be performed.

Before the trial was commenced each patient was subjected to the laboratory examinations noted above. These tests were repeated at fortnightly intervals throughout the period.

DISCUSSION

(1) *Adverse Reactions.*

No serious adverse reaction was observed during the trial. No pyrexia or fits were recorded in any of their patients.

The haematological examination was equally negative. There was no suggestion in any case of change in the blood picture and both the total white cell count and the differential white cell count remained unchanged throughout the trial. The E.S.R. also remained unchanged.

(2) Liver function tests also failed to show any material change in any of the subjects during the course of the trial and all the findings remained throughout within normal limits.

(2) *General Observations.*

(a) Side effects.—No side effects of any significance were noted in the course of the trial. Two patients became slightly drowsy and one complained of difficulty in focusing on any object; these complaints were transitory however and no specific treatment was offered to control these symptoms.

(b) Psychiatric note.—Nine out of twelve cases showed no response whatever to the drug and in the remaining three cases the improvement was of a limited character consisting largely of somewhat more spontaneous behaviour with greater interest in their environment and companions.

No specific effect on hallucinations, delusions or signs of release was noted.

SUMMARY

This is a brief account of a pilot trial with a new psychotomanic as a limited number of chronic patients undertaken on the first phase with a view to determining the toxicity of the drug in relation to side effects and laboratory findings and which it was planned to extend in a major manner to determine its value in psychiatric treatment.

The second phase of the trial was not successfully undertaken as though the drug so far was found to be safe and easy to handle, the lack of any marked response from a psychiatric point of view in this limited number of patients was not encouraging. In addition it was learned that it had been elevated by the manufacturer not to consider the production of this drug.

ACKNOWLEDGEMENTS

We wish to thank Messrs. Smith, Kline and French Laboratories Ltd. for sample supplies of the drug, also Dr. G. R. McLean of the Department of Pathology, Bristol Royal Infirmary and Mr. C. J. Barker, Senior Laboratory Technician of Barrie Hospital for the laboratory work involved, and Miss J. Davies, Pharmacist of Barrie Hospital.

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AN IMPROVED CONNECTION FOR NO. 12 MAGILL ENDOTRACHEAL TUBES

BY

Sergeant Lieutenant Commander J. C. P. S. R.N.
and Sick-Bay Party Officer CO 8 THOMAS

The central limb of the standard Magill Stiletto T Piece Connection, see figure, has a uniform diameter of approximately of an inch, to fit a number twelve Magill endotracheal tube. The side limb of the connexion has a smaller diameter, three-eighths of an inch, and consequently some of the advantages of

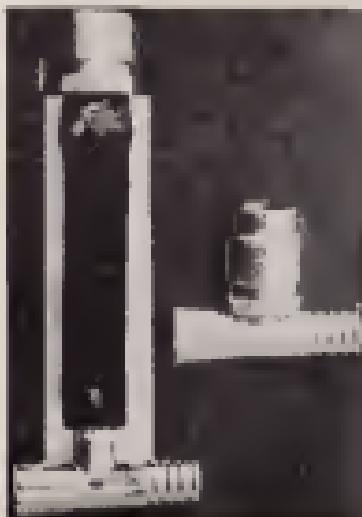


FIG. 1



Fig. 1

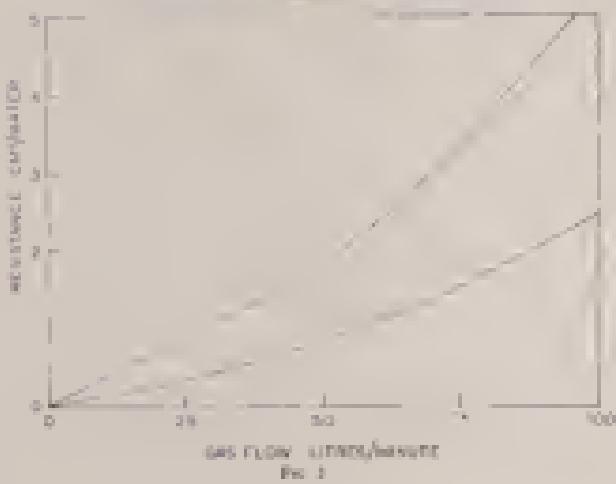


Fig. 2

1 large bore endotracheal tube are fast in the cannulae. In addition the standard endotracheal mount has a maximum diameter of three-eighths of an inch, causing a further increase in resistance to gas flow.

To overcome these disadvantages we have modified the nasotracheal tube in order to increase the bore of the side limb and to eliminate the rubber mount. The modification is shown in figs. 1 and 2. The side limb of the nasotracheal cannula is removed and the diameter of the remaining tube is increased to at least one-and-a-half times. The metal connector of a catheter mount for tracheal tube or Bourns Spring is also reduced to one-and-a-half times of its original diameter and the two soldered together.

Fig. 3 shows the resistance at various flow rates of above, the standard cannulae with catheter mount and below the modification.

Acknowledgments

We wish to thank Mr. Morgan, the hospital engineer who carried out the modifications and Leading Sick-Bath Attendant (X) L. Down for the photographs.

We are indebted to Surgeon Vice Admiral W. R. S. (Pawcridge) Q.H.P. for permission to publish this report.

Clinical Trials and Cases**TREATMENT OF GONORRHEA ON THE FAR EAST STATION**

III

Sergeant Lieutenant M. C. SNEEDLER, R.N.

In view of the past two years a number of observers have commented on the appearance of penicillin-resistant strains of gonococci.

King [1] from work in the Army Hospital "Hau-Dong-Duc-Tran" (Virology in dentistry) discussed a series of 72 cases of gonorrhoea treated with penicillin which demonstrated an increasing number of clinical failures, in the 1:1000 maximal inhibiting concentration of penicillin surviving. He concluded that "There is evidence that penicillin resistance strains of gonococci are now emerging." Some cases of such penicillin fail to make any response to doses of penicillin which in the past were nearly always effective. Repeated doses of penicillin and doubling the dose may then be effective. In other cases response seems satisfactory but relapse follows within a day or two. Quantitative assays test for sensitivity to penicillin suggest that in these cases exposures from the infections are considerably less sensitive to penicillin than the older naphthoquinone or other strains of gonococci.

Craddock-Watson et al. [2] made a study of 200 cases of male gonorrhoea seen between October 1957 and February 1958 in the U.S. departments of two London Teaching Hospitals. Culture of the specimens were made in each case and the sensitivity to penicillin, naphthoquinone and sulphuramides determined quantitatively. One of the surprising features of their results was the fact that 199 cases out of 200 were eradicated by 1 mg./ml. sulphathiazole, this in sharp contrast to the findings of Dunlop, Lovell and Pollard who reported that the majority of 65 strains of gonococci isolated by them in 1949 required more than 40 mg. sulphathiazole per ml. Craddock-Watson and his co-workers tested these 200 cases with 100,000 units penicillin penicillin which failed in 25 (12.5 per cent) of them and also showed that the number of clinical failures increased as severe penicillin-resistance increased. They concluded that "Our findings presently reflect the abandonment of sulphathiazole for the treatment of gonorrhoea in the country in recent years" and made the following

recommended in 1959. The overall cure rate using 300,000 units of penicillin is not satisfactory (87.5 per cent); but in view of the figures referred to in the paper, a dosage of 600,000 units will be used in future, and clinical supervision will be continued with streptomycin and sulphamerazine.

One of the main reports comes from Epitrix [3] who treated 147 cases of acute gonorrhoea at the National Thoracic Hospital Korea between 1st January 1959 and 1st April 1960. The total dosage was 1600 mg. of 600,000-unit penicillin and streptomycin, the total increase in the dose of penicillin as employed compared with current practice in the U.K. by approximately fewer than 30 treated failures. Thirteen of these failure cases were given a second course of penicillin and a successful outcome achieved in nine of them. Epitrix conclude that the 20 per cent failure rate was due to repeated penicillineresistance, although they did not have the laboratory facilities to demonstrate this.

The evidence from the United Kingdom indicates that stages of gonorrhoea which show resistance are only partially resistant and that clinical cures may still be obtained by increasing the dose of penicillin until blood levels are attained which are effective against the particular strain of organisms. King in the British Medical Journal [4] advises treating new cases of acute gonorrhoea with 600,000 units of penicillin penicillin or 1.0 gram of streptomycin and to use the older drug without delay should the one chosen fail to produce the desired effect.

In 1959, a report together with eight equal numbers, stated from Malaya to use the Far East Fleet. Altogether, the Far East Fleets (Far East) comprised some 462 officers and men. It was anticipated that the incidence of venereal disease in the Fleets would remain reasonably in the Far East and during the first four months on the station it proved to be the greatest single medical problem. Between 1st December, 1959 and 31st March, 1960 no fewer than 189 fresh cases of venereal disease were treated in the sick bay.

(i) Convalescent	-	88 cases.
(ii) New episode on board	-	41 cases
(iii) Chartered	-	4 cases

These figures compare most satisfactorily with a total of 40 cases treated in two years on the Mediterranean Station with seven equal numbers each in the Fleets (in further 200 cases) instead of only eight.

Early experience confirmed that the incidence of venereal disease was rising sharply and it was decided to carry out a small scale clinical trial to obtain some indication of the incidence of antibiotic-resistance in gonorrhoea on the Far East Station. The Fleets were based at Singapore and the investigations were restricted to the men of Malaya during the period under discussion, although Hong Kong was visited on one occasion during the month of March. It was learned immediately before the war that the incidence of penicillin-resistant gonorrhoea in Hong Kong was high and cases of gonorrhoea encountered there will be considered separately.

METHOD AND MATERIAL

During April 1961, out of a total number of 54 cases of acute gonorrhoea treated on sea, say between 1st December 1960 and 31st March 1961, were available for scrutiny, the remainder having been forwarded to other ships and establishments when the patients left the Asiatic. 15 of these cases were contracted in Singapore or Malaya, eight in Hong Kong.

Diagnosis.—Laboratory facilities on a small sailing ship are limited and both the diagnosis and follow-up of individual cases were based largely on the microscopic examination of slides caused by Gram's method, together with the clinical findings. Throughout the trial rigid aseptic surgical scrubs were applied and operations considered to resemble the gynaecous had to be Gram-stained to stop-shaped sulphur with a fair proportion of rachis-like groups of organisms present on the slide. In cases of doubt the slide was repeated twenty-four hours later.

Mycovirus.—Once the diagnosis had been confirmed, a 5 ml. sample of blood was taken for one minute F.P.R. and Rabin tests and a single transcutaneous injection of either penicillin or streptomycin given. The patient was examined the following day and a further slide taken. Close following to the night objectives normally had no gonococci on the slide taken after twenty-four hours and the discharge ceased altogether within forty-eight hours. If gonococci were seen after twenty-four hours the slide was repeated on the following day when the continued presence of these organisms was taken to indicate clinical failure of the particular treatment given and the signal for a change to streptomycin or penicillin, as advocated by King [1]. A number of cases of penicillin and/or streptomycin were encountered in which gonococci had disappeared from slides made twenty-four hours after the first injection and these were regarded as cases of non-resistant and specific antibiotic and treated with either a course of sulphamerazine or one of the two injectant group of antibiotics.

TREATMENT AND RESULTS

Singapore and Malaya

Individual cases were placed at random in one of three treatment groups.

- (1) Group A received a single injection of 500,000 units of P.A.M. (Penicilline potassium salt with 2 per cent. Glucosamine mononitrate).
- (2) Group B received a single injection of 600,000 units of P.A.M.
- (3) Group C received a single injection of 1-0 grammes streptomycin.

Results

The results of treatment are shown in Table I below.

Table I

Group	No. of cases	clinical failure	Failure rate
A	11	2	18.2 per cent
B	8	1	12.5 per cent
C	14	2	14.3 per cent

More resistance.

In view of the modified reports of large numbers of penicillin resistant *Leishmania* parasites in Hong Kong, it was decided to double the dose of penicillin in Groups A and B, so that cases in Group A received 1000 000 units of P.A.M. and cases in Group B 1 200 000 units. Cases in Group C received 1.0 gramme streptomycin as before. The results are shown in Table II.

Table II

Group	No. of cases	No. of cleared patients	Failure rate
A	1	1	0 per cent
B	1	1	0 per cent
C	1	1	0 per cent

DISCUSSION

The small number of cases treated paradoxically in the Hong Kong series makes any detailed appraisal of these results impossible, but nevertheless, the following points seem worthy of comment:

(1) In the Singapore-Malaya series, the mean failure rate in the 21 cases of Groups A and B was 21.8 per cent. No apparent benefit resulted from increasing the dose of penicillin to 800 000 units, but the small number of cases precluded probable inferences for this.

(2) From allowing for the small number of cases treated in Hong Kong, the 0.7 per cent mean failure rate obtained with single regimens of penicillin is significantly higher than that experienced in the Singapore series.

(3) The failure rate using single regimens of 1.0 gramme streptomycin was 14.3 per cent in cases treated from Singapore and Malaya.

Against a failure rate of 30 per cent, streptomycin in Kenya has been given 1.0 dashipent recorded to date and was higher than the 12.2 per cent failure rate calculated by Chisholm, Webster et al. in London. The results obtained in the small series using conventional doses of penicillin suggest that the development of penicillin resistance in the parasites is gathering momentum in certain parts of the world and it is perhaps not surprising that notorious blasterjags such as Hong Kong have, taken the lead. Increasing the single dose of penicillin to 1 200 000 units did not produce any dramatic improvement in results despite the short note in the Public Health Section of the "Annual Report for Hong Kong 1959" which states that penicillin continues to be the first choice for the treatment of cutaneous and mucocutaneous leishmaniasis in the Colony and makes no mention of penicillin resistance in the parasites.

Eysen's figures using 3-0 Mogen units of penicillin indicate the pressing need for urgent laboratory investigation in the Far East of the development of antibiotic resistance in the parasites to be monitored. Such an investigation could be profitably coupled to a clinical trial along the lines followed by Chisholm, Webster et al.

The risk of making a non-existent sulphur infection with penicillin administered in the treatment of leishmaniasis has, until recently been the most

important factor keeping the dose of that drug as low as possible. In 1948 when penicillin was used to treat the large numbers of cases of gonorrhoea immediately after the war, the incidence of syphilis was also at a peak and the rate was indeed a real one. During the past fourteen years, however, the incidence of syphilis has fallen throughout the world and the risk of involving the disease has correspondingly lessened. In a year, for example, there were only 28 cases of primary and secondary syphilis treated in Government Clinics in the Colony of Hong Kong. Some workers consider that provided that adequate Wassermann surveillance is rigorously carried out, the risk attending the administration of 3.0 Mega units of penicillin in the treatment of acute gonorrhoea is now acceptable. This argument would be more acceptable, however, if there were no alternative treatment available but Crookshank-Wilson's results in 1958 lend strong support to his recommendation of streptomycin plus a sulphaphamide: about 600,000 units of penicillin failed to control the infection. In the absence of further information on the development of antibiotic-resistance in the gonococcus in the Far East, this method would seem to be preferable to increasing the dose of penicillin as suggested by Eysen, with the knowledge that the treatment will fail in 20 per cent. of the cases.

Conclusions

The results of treating 43 cases of gonorrhoea in Singapore, Malaya and Hong Kong in early 1960 suggest that the development of penicillineresistance in the gonococcus is gathering momentum in the Far East and underline the urgent need for laboratory investigations. While awaiting the results of such an investigation, it is recommended that cases of acute gonorrhoea are given 600,000 units penicillin orally and if this fails to control the infection then the treatment is changed to 1.0 gramme streptomycin plus a course of one of the sulphonamides as suggested by Crookshank-Wilson *et al.* It is considered that this method of tackling the problem is preferable to increasing the dose of penicillin which increases the risk of involving syphilis and does not appear to effect the clinical result very much, unless large doses are employed.

Summary

The results of treating 43 cases of acute gonorrhoea registered in Singapore, Malaya and Hong Kong are described. In Singapore and Malaya, the failure rate using single injections of either 300,000 units or 600,000 units of penicillin penicillin was 29.8 per cent. and 14.3 per cent using 1.0 gramme streptomycin. No apparent advantage was observed by increasing the dose of penicillin from 300,000 units to 600,000 units in this series. In Hong Kong, the failure rate in 8 cases treated with single injections of penicillin was 67 per cent., despite the fact that the dosage was increased to 600,000 units and 1,200,000 units in the few trial groups.

It is considered that there is an urgent need for laboratory investigations of the problem of antibiotic-resistance in the gonococcus in the Far East.

In view of the above, of penicillin used in the treatment of acute goutiness, as advocated by Tamm, is not without danger and in the absence of reliable data on the side of anti-thrombocytopenia in the goutiness it is recommended that 1.0 gramine streptomycin combined with a course of sulphamamide be given should 600,000 units of penicillin present fail to bring the infection under control.

ACKNOWLEDGMENT

I should like to express my thanks to S.S.P.D. Dr. R. Lohy for his assistance in preparing the table and the organization of the V.D. Clinic, which occupied so much of the time during the early days on the far East Station.

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A CASE OF ESSENTIAL HYPERCHOLESTEROLEMIC-XANTHOMATOSIS ASSOCIATED WITH LIPOEMIC SPERMUM

15

George Lovell and R. RADFORD, B.M.

The particular interest in this case lies in the occurrence of a milky appearance when measured hypercholesterolemia xanthomatosis, a disease which, until recently was regarded as being invariably associated with a clear (non-lipemic) serum.

CASE REPORT

The patient was a male whose aged 29 years. His complaints were of lumps on his elbow, knee, wrists and buttocks and an unusual thickness of his pulse. He had noticed these changes developing in the preceding eight months but did not regard them as anything serious. He had not sought advice earlier.

On examination the lumps were easily recognizable as xanthomas. They were firm orange-yellow subcutaneous nodules varying from 1 to 10 mm. in diameter. Over the lumps palpable they tended to be large and more confluent while on the buttocks they were small and scattered. There was no rash very confined to the nose and anterior aspects. The skin over the lumps was thin and marked with blood vessels. Surrounding there was a blue methaemoglobin halo. There were slight tender no pustules.

The pulse was a striking orange colour and on close examination the palmar creases were reddened with fine orange nodules. There was no lesion in the mouth or faeces nor was there a cervical area.

General physical examination revealed no other abnormalities. In particular there was no enlargement of the liver or spleen, no jaundice and no abnormality of the C.V.S. or heart. There was no glycosuria or proteinuria.

After four days the patient considered himself to be in perfect health. He ate a lot of eggs and cheese, but afterwards his face was quite swollen.

This was no history of significant past illness.

The patient's father had had three episodes of coronary thrombosis after the age of 40 who was about 60 years old. Otherwise all the relatives in these paternal lines were known to have normal lifespans and none seemed to have suffered with early coronary disease. The patient had one uncle aged 33 and another had been widowed. His mother suffered with gout, an interesting history, which will be elicited in later.

Hypertension.—Systolic blood-pressure 160 mm. per cent. Systolic diastolic pressure 100 mm. per cent. Systolic mean and 92 mm. per cent. Plasma fibrinogen 17 mg. per cent. Urologist—No abdominal problem or Homan's syndrome. No history of hypertension. ECG (Fig. 1) (Dr. G. S. Smith, B.M.C.) Standard leads I, II, III, AVF, AVL, V₁ to V₄ with normal limits. Echocardiogram (Dr. C. G. P. Bell, R.H.A.) "Normal."

A presumptive diagnosis of Transient Hypertension was made, and the patient was placed on a low cholesterol diet.

At the end of three months' treatment and dieting, no improvement had taken place although weight loss and blood-pressure in the long run, on new measurements appeared

Examination of the veins showed that the diameter of vein was less 300 mg. per cent, and that the right axillary previously observed was still present, as part of a long-standing varicole.

It was decided to try to control the hypertension more firmly by a more detailed examination of the coronary vessels. This was very kindly undertaken by Dr. W. D. Thompson Consultant Cardiothoracic Surgeon Middlesex Hospital, who reported as follows:

"One hour delay in trans-oesophageal angiogram as follows. At 1000 mg. I.V. midazolam + 40 mg. (This is rather more sedated than the norm of most people after a drug alone.)

Arterial catheter
Right radial artery 1700 mg. per cent. Normals (Chloroform)

Right brachial artery 400 mg. per cent. 400-500 mg. per cent

Choroid 400 mg. per cent. 150-200 mg. per cent

Phlebotomous 300 mg. per cent. 100-200 mg. per cent

The figure obtained by subtracting the normal vessel from the usually measured lower than that obtained by thought he could easily be because the diameter of veins is not very variable in patients who used to extract the veins (I used often to practise this). Please a report.

The angiographer claimed a strong and regular pulse (and of 100 per minute and a strong systolic pulse to the first, second and third-order arteries).

The final sign was very similar in these cases to Dr. Rivers and I put at the same absolute value.

This corresponds with a group of cases involving the hypophysis patient but I suspect of both the hypophyseal and the hyperthyroid disease types.

I was advised to try the effect of a supplement of testosterone but in the end. Accordingly the low cholesterol diet was continued and 30 grams of corn oil given twice daily.

At the end of a month a further operation of blood was arranged. The serum cholesterol had risen to approximately 270 mg. per cent, and angiography using fluorescein dye previously arranged. No striking change had taken place in the veins, although the patient felt that they were less compressible. No varix was found.

The patients were advised to continue the diet indefinitely and a recommendation to this effect was passed to the Army Medical Services so that where ever he was posted he had no apparent

Discussion

Xanthomatosis together with a raised serum cholesterol occurs in a number of conditions. They are summarized as follows:

(1) SYMPTOMATIC.—

Secondary to nephrosis, associated diabetes mellitus, thyrotoxic disease, urinary carcinoma, chronic pancreatitis.

(2) ESSENTIAL.—

(a) Essential hypertension and arteriosclerosis

(b) Essential (Essential) (Ischaemic) hypothyroidism and arteriosclerosis

The typical features of essential hypertension and arteriosclerosis are triglyceridaemia (varying crops of small tender yellow-brown papules surrounded by red erythema), hair in early childhood, in some cases, hepatosplenomegaly and attacks of abdominal pain.

The typical features of essential hypothyroidism and arteriosclerosis are pale and tubercular skin, and a clear serum.

In addition further types of differentiation based on serum lipid analyses, responsive to isoproterenol, uric acid and sugar analysis have been described (Pritchard, 1956; Bearn, 1957).

Diamondfield (1958) pointed out that at first he had assumed and later was among other reported series, there existed cases with features of both conditions. Since they were able to classify as essential (Ischaemic) hypertension and arteriosclerosis with an associated hypothyroidism (in one of the cases the hypothyroid developed whilst under observation), others had a number of features of both conditions, and then they classified as mixed types.

The case here described is very similar to the three cases Bearn described of essential (ischaemic) hypothyroidism and arteriosclerosis with associated hypotension. It is interesting how the pulse changes have been comparable in such cases.

I have no explanation for the low blood sugar. The investigation was repeated and a similar result obtained. He had no symptoms of hypoglycaemia at any time.

It will be noted that the lesions in this case followed the usual distribution of tubercular cutaneous in being more evident at the sites of pressure and trauma — the elbow having a desk job perhaps explaining those on the inner aspect of the wrist as well as those on the buttocks. A practical point arising in this connection is that some tender deposits focused in the inguinal area and then being on the elbow it caused the patient considerable inconvenience. Another site would have been preferable.

The greater features of essential hypothyroidism and arteriosclerosis have been studied by Williamson *et al.* (1952) and Harrelson *et al.* (1957). The raised blood cholesterol is a dominant trait and the fully developed syndrome with arteriosclerosis is probably the homozygous state. In this case it has not been possible to study the family thoroughly, but it is interesting to note that the father had early coronary disease and that the mother had gout. Hypertension and hypercholesterolaemia have been reported as factors with gout (Albrey,

1973, quoted by Harrison-Jones, 1977). Hypertrophic cardiomyopathy has familial characteristics in some cases but the genetics have not to my knowledge been worked out.

The prognosis of both hypercholesterolemia and hypertrophic cardiomyopathy is bad, early death from coronary occlusion occurring in both (Lever et al. 1959).

Treatment of the disease is based on the assumption that reduction in the serum cholesterol will reduce the tendency to atherosclerosis. This has been accepted by both diet and drugs. Reducing the intake of cholesterol or inhibiting its absorption from the gut by adding Stanolene (a sterol-free oil cholesterol) to the diet is not successful, as the body can readily manufacture cholesterol from serum acetate. By way of drug therapy, thyroid hormone, niacin and fibrates have all been used without notable success.

Makinson and Wigand (1978) treated 8 cases of hypertrophic cardiomyopathy with a diet rich in pure oil and cholesterol is correspondingly low in the serum and raised level. This correlated with Broadbent et al.'s report (1964) on the effect of certain unsaturated oils on cholesterol metabolism.

In the present case a substantial though fall in the serum cholesterol level has been obtained by the addition of a highly saturated fat to the diet and it is hoped this uniformly however, treatment will be, means of controlling a serious disease.

ACKNOWLEDGEMENTS

I am grateful to Surgeon Commander G. M. Shull, R.N. for permission to publish this account and to Surgeon Commander P. D. Steele, R.N. for valuable advice.

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Reviews

British Diseases. By Charles Rawson, M.D., F.R.C.P. Physician Royal Derby, & a Senior Medical Consulting Physician at the Middlesex Orthopaedic Hospital, Broadgate, England. (See *Index* and the *Review of Reviews*, *Tablet* [June, Pg. 616], 1959.) Edinburgh and London: E. & S. Livingstone Ltd. Price 25s. Metric postage 1/- 1d.

The author has selected 16000000 — 1600000000, or so fifth edition in the class of diseases where a fairly early estimate of its popularity and of the desirability of an edition so long delayed with modest views and the very welcome freedom of knowledge.

To those who know this unique book of medical diagnosis, it may be said that the last edition has been thoroughly revised and substantially rewritten and 140 years of medical knowledge have been incorporated by several of the author's former students, specialists in their own subjects.

To the unacquainted it is natural to say that this book contains 26 chapters, all of which excepting three have a chapter synopsis in their title e.g. Thoracic Diseases, Lumbosacral Pain, Hernia, Appendicitis, Diaphragm, etc. The chapter summaries will be synopses of the account of the corresponding symptoms followed by a few paragraphs containing the main points and references for consulting in each individual concerned disease, symptom, history, pathology, differential diagnosis, and management advised. At the end of every book are these chapter-giving numerical values: the new volume is unique in diagnosis and its synopsis divided into definite groups of drugs.

In many ways this book can be considered as a small edition of the famous French *Atlas of the Diseases of the Human Body* — and no better primer need be given in this regard.

It would appear that the medical student and newly qualified doctor would be the main users of this book, more benefit from the diagrams, handbook, and for the numerous conditions which require synthesis of the various diseases, symptoms, and treatments the practitioner will find very useful this presenting well in tables symptoms, and diseases, the differential diagnosis. On the other hand, many a long practitioner may feel that book of immemorial value when attempting to solve an individualized case due "one of the diagnostic problems presented in the patient's history". L. G. T.

Non Diseases or Non Diseases. By G. H. Cleare, M.B., Ch.M., M.R.C.P. F.R.C.P. Pg. viii + 160 + 24 illustrations. London: W. K. Lewis Ltd. Price 24s.

There cannot at least have been a longer gap of over thirty years between the original and this second edition than exists between the original author of earlier editions and now the addition of a few paragraphs on modern therapeutics.

In the preface, in the first edition, the author has pointed out that since that E. C. Smith's *Atlas of Skin Diseases* (1921) is unsatisfactory there is no other work devoted exclusively to dermatology in the English. This in itself need make such a release of concern useless.

Dr. Cleare has decided the work and I wonder if that is true. In fact all discussions on skin have been repeated in Nigards very general according to their sources, e.g. those

QUICKSILVER IN THEATRE. By GORDON THOMAS, a collection of 11 complete full-length plays originally produced in America. (A. & C. Black, 1952.) £3 10s. 6d. This is a good collection of plays, ranging between well staged drama.

This is essentially an editor and is consisting of 204 pages of 111 short, well printed, high-quality full-length plays of colour which is an advantage when colour prints are limited to the grey brown range. The area is confined to a few clearly marked off the commercial catalogue, without any suggestion of so-called "Theatre in America". There is however a very useful introduction giving a brief history of the development of the original plays which have been chosen on individual dramatic value, special reference to the stage.

The reviewer while fully recognising the limitations of any such collection feels that this handsomely produced edition should prove of value not only to those in general practice in stage, but also to those in medicine or anywhere who are often presented by the dramatic problems presented by the stories that

H. H.

SURGICAL PATHOLOGY IN WAR CONDITIONS. By Werner F. REED, A. B. WILLIS, M.D., and Carl W. HUGHES, A.B., M.D., Chief and Assistant Chief respectively, Department of Surgery, Walter U.S. Army Hospital Hospital, Princeton, N.J. Oxford: Blackwell Scientific Publishers Ltd. Price 25s.

The subject matter of this book has been developed from a number of previously published papers some of which may be found in a symposium on the management of war casualties at Walter Army Medical Center, Princeton, N.J. in 1950.

It is a book which is of interest to only to the specialist rather than general practitioner of surgery and is intended primarily for American contingencies. As the title implies, it prepares us to consider especially the importance demands that the conditions of nuclear warfare will place upon available medical resources and to the question what to do about combat casualties which they will sustain.

The authors are themselves as stimulate with a chapter on "What our troops needs in accordance to possible armed confrontation with the communists, measure the difficulties, where the solutions, we are faced with the situation, but still in the power to act as a major element of the problem remains in the end that we may make effective health services, plan on such a form."

This might have succeeded better by the adoption of a more systematic, but unfortunately represents the present aspects of accepting, hospital practice, and the training of medical and nursing personnel with communists rather than emphasising the principles that need be observed in a programme rather like samples of various combat casualty plans, policies, programs, which in this case are very much sketchy.

However the book does not deal exclusively with the surgery of nuclear warfare. Large scale air raid disasters are discussed and the authors are not slow to point out the lesson that they might whilst the authors in the last but one of "Conclusion" and the treatment of regional injuries are admirable.

In illustrating this work a number of good monographs are given more or less briefly, there are some interesting articles and a few short plays. But there is good reading and excellent teaching for students, physicians and nurses alike who might find himself involved in the various aspects of mass casualty care operations.

J. M.

ANATOMICAL AND RADIOLOGICAL INVESTIGATIONS IN OSTEOPATHY. By Arnold SARTORI, M.B., F.R.C.S. Research Registrar in Orthopaedics, Royal College of Surgeons, and Ray D. Eye Hospital, St. Bartholomew's Hospital and Middlesex Union, M.D., D.C.P. Head of the Radiological Research Department, Glaxo Laboratories, Consultant Radiologist, Middlesex Hospital. Pp. 111. London: Oxford University Press. Price 15s. 6d.

This little book contains a very comprehensive and up-to-date account of the applications of Radiology to Osteopathy. Both authors are recognized authorities in this field. Profound

having a lecture on the subject having been received for many years. However, it is only during the eight centuries or more past when, and also the methods by which, it has been so applied. The author profits greatly in stating his approach and that is in keeping with the nature of those who have in mind large numbers of users at first stages. They reflect the simplicity of simple tests, publications he considers a variety of publications, but one of the aspects that had significance is always in the form of a photographically reduced copy of an index of rates utilising existing readily available. They believe that particular could be more easily understood and the more unusual when appropriately explained. The book is well put and is to be commended in this respect. The presentation is well designed for quick reference and the author is excellent. It is a pity that a bundle of them, *Primer*, type should be so expensively produced.

D. P. C.

Primer of Chemical Thermodynamics. By J. M. BIRD, M.A., M.D.CHEM., F.R.I.C., F.R.S.T.P. £1.50 (with illustrations). London: Edward Arnold (Books) Ltd. (Price, 6s.)

In addition to his former, somewhat unimpressive, *A Large Simple Heat Engine* (see *Chemical News* 1951, 161, 211), of which this is a sort of follow-up, it is an account of the author's efforts towards the application of thermodynamics to undergraduate courses, and his efforts in that direction are apparent.

The really impressive first chapter reads as follows: "In my view, thermodynamics and its applications are not of use to us. The theory of the second law, both molecular and classical, and equally well known, for the order of accuracy in its predictions, gives us a very useful guide to what is possible, but, already incomplete at 1910, it is, from some sources, regarded as rather dead." This, though, causes no problem, since, as the author says, "it is right to teach simple—first-life, intuitive physics which attempts to be like, the, physical world intuitively, or beyond a certain degree, of fuller form, as best we can." The reader, along with me, would

say, "What?" After giving a detailed account of his efforts in the subject, the author quotes again: "I have come to the conclusion that it is not a good example for this, or even thermodynamics, to be offered as an alternative. After discussing the lecture which makes an excellent speech, but poor for power, he points out what is not generally realized—that all major topics from the more advanced side, light, motion, temperature, etc., which were represented in the first chapters require major practical figures. What this is used to illustrate the physical consequences, and nothing else, is irrelevant to the use of thermodynamics."

The real big advantage of this is in its approach, not, in my humble opinion, as described—which provides a nice explosive but worthless exercise of thermodynamics, oxygen and nitrogen from iron “*Aqua Regia*” bath. The account of a series of 1900 lectures on the hydrogen-oxygen fuel-cell, which illustrates a most encouraging answer to the only real question raised, never presented figures. What this is used to illustrate the physical consequences, and nothing else, is irrelevant to the use of thermodynamics.

This book is very well put and its original approach is a very welcome addition to what is available in all Technical Colleges—although it may well discourage them and reward University users for their present offerings.

A. D. C.

Drugs in the Blood. By JOHN MARSHALL, M.D. LONDON. Head of the Department of Pharmacology, University of Edinburgh, Medical School, South Parks Road. Pp. viii + 264. 12s. (Clothes, 1s.; half-bound, 1s. 6d.). Edinburgh and London: E. & S. Livingstone Ltd. (Price, 1s. 6d.). Postage 3s. 6d.

The value of any reference book to an individual reader must rest on his knowledge of the particular concerned. The author states in his introduction that he has tried

to give him first-hand understanding and, great as grants are, may not be sufficient and that will need to be adequate reading for young pharmacologists. By which he presumably means those under training in business Pharmacology.

This is a nicely produced reference book, good quality paper, with a thin type which is easy to read. It appears to be well up to date, reflecting no additions on *General pharmacology* since its

perhaps a tendency to concentrate too much on the use of equine serum. Equine serum does not fit the therapy used in this book at all. All the places can be found in equine serum although you are very good there are many which are poor. Immunology is not mentioned where certain patients will find it useful if it would have been the book could be still better if not a few numbers of certain patients were included. The price of the book is still very reasonable, this is definitely justified. Again for the treated equine immunotherapy is an option or an aspect and although this is aimed for on the new there are practically no references in this particular book.

Other references are: 10) The present management of equine eye disease without paying for extensive lists or lists of the publications. 11) The lack of reference to regional equine practice during such recent discussions.

And although at the very top Sir Smith's Address is in the book, may be, deserves no place for equine immunotherapy. Up till now there is no mention of it, then the author is still more ignorant. 12) None.

This is a starting point and easily to observe in the arrangement and organization of general immunotherapy. Unfortunately no further information is as yet sufficiently detailed for its own value as immunotherapy. It might have a limited appeal for this, in my opinion on the first part of your guidance in immunotherapy chapter, or as a reference book for the general physician work on equine or horses.

P. S.

Parasite Dermatology. By Charles Wells. Professor of Veterinary Medicine at the University of Liverpool and James Kyle. MVB, MSc, FRCVS. Senior Lecturer in Parasites, the University of Aberdeen and Veterinary Consultant to Boots, Almond Road Laboratory, Po. Box 44, Edinburgh. London and Edinburgh: F. & S. Livingston Ltd. Price £3.50.

There is little which is pathologically different. Described as "a symposium for veterinary students and research workers concerned with the fields of Veterinary Pathology, Animal Nutrition and Zoology" it aims to present a comprehensive survey of recent research into the morphology and pathology of parasites, attention and the problems resulting in complications and control of parasites.

Although an extensive range of relevant literature is included in each chapter, emphasis is on practical medicine. In fact the great value of the book lies in its practical treatment of factors affecting skin diseases in the animal, methods of diagnosis and its analysis of all anti-parasitic treatments with regard to methods of dealing with them. There is also an excellent section on the treatment of ectoparasitic infestations.

There is a foreword and Professor Wells' monograph on Pneumocystis will be followed with his usual style, original thinking and sound practical advice. They will find however little equality in all produced and nothing.

A delightful review of the book and the Tick-borne Diseases of Cattle, who is primarily responsible for the modern range of knowledge and experience of English clinicians from the past and present or known of the great masters of past no longer. We lose a few pages from this book when given reference for publication in 1971 with only one and a half hours in complete copy due to bad book suggested copies over previously by a young physician (Karl Weyers) which was successfully used in the open service stage.

Altogether a most interesting book which no general veterinary will afford to ignore.

P. S.

General Anesthesia for Dental Patients. By R. J. Webb, M.A., B.V.Sc., F.F.A.R.C.V.S., Pg. 19, 1974. (Price 25/-). London: Meyer-Lindberg. Green & Co. Ltd. 4 and 5 Clifford Street. Price 25/-.

This is a thin and easily read reference of interest to all who have anything to do with General Anesthesia for Dental Patients.

I think the Hinckley technique for administration of nitrous oxide and oxygen

Indoor lighting and other avoidance with such options as *Wilson*, *Whirlwind*, *Buck*, *Scout*, *Scout*.

Chapters are included on Children: The Greatest Potential and Asset; Adolescents: The Greatest Risk; Major Adversities as an Opportunity; The role with post-adolescent children; and *Conclusion*. The book concludes with a section on how to evaluate prevention programs.

The field is well-organized and thorough, covers everything normally required, and much more, such as the *Chemical Sciences*.

Practitioner Committee: Dr. William A. H. Thompson, M.D., F.P. 40, Lynden. The Practitioner's Committee consists of Dr. William A. H. Thompson, M.D., F.P. 40, Lynden.

The small library is a reproduction of The Princeton studio model. It will accommodate 100 books.

These are, roughly speaking, and slightly more or less, the same as those of the United States Bureau. There are additional data for households in the Black Rock Desert and Big Pine, California, places dry desert, low life and low number requirements, and no addition, waterless deserts far off from civilization. The maps are such that they can be prepared easily by an expert map house, the specifications being given with the drafting of householders to send in their names. It is necessary, however, for map house.

From the Service, single sheet or books of 100 leaf which is to be applied generally to the arrangement of words, as the drawing ought of the longer to set the short books will be well recommended.

The following will be the goals of the following unit:

Classical and Bayesian

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George Edward Harry HILDEBOLD, Jr., died on Dec. 19th, April 1962. Buried on Dec. 21st, 1962.

He entered the Royal Naval School Dartmouth as a Cadet on the 25th May 1877. He was promoted to Sub-Lieutenant on the 15th May 1886 and Lieutenant Commander on the 25th May 1891. He was promoted to the rank of Captain on the 1st January 1902.

Douglas Woodburn et al. (Eds.), *Advances in Human Resource Management*, Sage, Thousand Oaks, CA, 1997.

Sergeant Captain H. J. A. LINDGREN, D.S.O., started his service as a Sergeant on the 1st August 1915, he qualified as a Pilot on 1st April 1918.

He served as a Royal Naval Medical Surgeon as a Surgeon under Staff Captain 1918-19, as a Lieutenant Staff Surgeon on the 2nd August 1919, and Surgeon Commander on the 2nd August 1921. He was placed on the Retired List with the rank of Surgeon Captain on 1st August 1925.

He was promoted to Surgeon Commander on 1st March 1941.

During World War I he served as 30 M.R.P. Pilot H.M.S. *Goliath* and at Green Head Bay.

Sergeant Captain H. M. LYNNHALLIS, R.N., started on the 1st May 1915. He was born on 1st July 1889 and qualified M.B.C.S. 1st June 1912 F.L.S. London in 1920.

Sergeant Captain Lynnhalleson the Royal Naval Medical Service as a Surgeon on the 1st May 1917. He was promoted Surgeon Lieutenant Commander on the 1st December 1918 and Surgeon Commander on 1st November 1919. He was placed on the Retired List with the rank of Surgeon Captain on 1st July 1926. He was appointed P.W.I.O. Retired on 25th January 1932 and had this appointment until January 1941. On 25th July 1941 he was re-plied and was received in the Retired List on 25th September 1941.

During World War I he served in the Royal Naval Hospital Harwich and in 30 M.R.P. College and H.M.S. *Clyde*. In World War II he was appointed to M.T.D. Headquarters and also held appointments of H.M.S. *Auron* and the R.A. *Orion*, Cambridge.

Sergeant Captain C. W. M. LYTTLE, Royal Navy, died on the 1st of May 1940. He was born on 1st May 1886 and qualified M.B. B.C.S. at the University of the West Indies at Johannesburg, South Africa.

Sergeant Captain Lyttle served the Royal Naval Medical Service as a Chief Surgeon Doctor on the 1st December 1915. He was promoted to the Permanent List on the 1st March 1920. He was promoted to Surgeon Lieutenant Commander on the 2nd December 1926 Surgeon Commander on 2nd December 1942 and to Surgeon Captain on 1st June 1943. Surgeon Captain Lyttle was placed on the Retired List (immediately) on 25th April 1949.

D. F. W. writes:

On the extensive death of Christopher Frost I have lost an old and valued friend. The Survey has lost a very good sailing Master Officer. I am compelled to write, and of course distributing Notes difficult just for the purpose of informing how Christopher would these present as such a pleasure had been to all of us. He was a person who had many fine qualities and absolute reliability. His choice of the survey was not for its pay but for its work. I can't imagine him anywhere else. And slightly worked to one side making partly his emphasis on more the large areas of offshore navigation. You know you can lose only one experience in such areas. This person may, as many will know from the most commanding Master Officer, the highly regarded and highly paid of the crew commanding. Christopher of his many qualities, with a warning such as disseminate from any suggestion of inefficiency.

I knew Christopher for a long time. He was a man of many parts. His official position did not interfere with his studies, stamping over a wide field from the Arts and Humanities to Zoology. Yet he was not a superficially informed Jack of all trades. The depth of his knowledge was astonishing. A prodigious reader, highly cultured above ordinary and a polymath through necessary broad subjects and gifted in all's professional interests. He was a reservoir of detailed knowledge which he could produce at the appropriate moment in the ordinary practice of his business. A comprehensive knowledge of nautical science and a wide range of literature, many at least for interest reading, claimed an extraordinary and in certain fields probably the most detailed among all the naval officers. His books were few but His research was extensive. His knowledge generous.

— He was a good man, being generally regarded as people as all who met him or worked under him as a surgeon. He will especially give his best wishes to those who have or continue to be patients. His humanity was unexampled, his good works legion and unnumbered. His only regret was to his friends that he could not confide their names. A member of the church, an ardent Anglo-Churchite, always observed in these hours his silence of course having no religious dispensation from his belief in the Saviour, but they had been given of the Prince which he loved, who helped them.

He taught the Army, as always, to give the best. One in the Service, some time ago, wrote, "I am grateful the Army is now, third. That and only that was, parental alike, to me." He would have done more than he did to expand its reputation had he been fit to fill the position of the Royal Naval Medical Service. He had the strength of temperament and an enviable experience from Naval service, but the influence at least he was given, I, as a colleague in our ranks, was much smaller. He will be missed by many, and appreciated by all.

M. V. R. G. (cont'd.)

He could talk so well and so long on Chancery Court as regards his hospitals and cases, and during his life alone a vast library. He had been stamp'd by undifferent health needs of society. As a surgeon he had developed a decided idea of high social regard for most if not all, and it is to be observed in his P.M. Merely before that was a less illustrious record, indeed in one year a man over 50 years old, and a considerable income of pauperage.

He leaves us well as regards that what the final autopsy will likely to be, and during the last eighteen months when his health and strength were steadily declining, he was almost entirely at rest, and that his days were largely passed in his study, in his library, where he had a profound and practical philosophy which could have no great value in this life.

He must stand as such as a model, and when he died he was under medical process arrangements as far as he could control, aiming at sparing health all possible trouble.

The local war cemetery at Armentières, the major cemetery, is again to be occupied with most of the dead, and death deserves as in other things, and therefore death here is finally merciful here.

Some weeks before he died I remarked to him that I had followed him through many severe health and disabilities, such as world war, a lesson more, even nearly a disease, and I could but rejoice his recovery. He expressed quite firmly that the noted was in itself his best, though there is pleasure in living, for local duty seems to accept the inevitable and later still, the home beyond all possibility.

We feel very sure that his ashes should be scattered on the solitudes of Germany which he knew so well and loved so deeply.

Sergeant Captain R. Eustace M.R.C.V.S. R.M. died on the 10th July 1938. He was 47 years old. He qualified M.R.C.V.S. 1912. Practised on 1914.

Sergeant Captain Wallis joined the Royal Naval Medical Service as a Surgeon on the 2nd November 1908. He was promoted Surgeon Lieutenant Commander on the 2nd December 1912, and Surgeon Commander on 1st October 1917. He was placed on the Reserve List with the rank of Surgeon Captain on the 8th December 1928.

During World War I he served on H.M.S. *Lion* H.M.S. *King Edward VII* H.M.S. *Prince H.M.S. Roberts* and on the *Lifford* Hospital. During World War II Surgeon Captain Wallis served as a medical consultant.

HAGHORN, BACHELS

- (1) P.H.—Surgeon Lieutenant Commander G. A. H. Gell
- (2) R.E.D.—Surgeon Lieutenant R. H. McCullagh
- (3) R.F.D.—Surgeon Lieutenant H. J. Black
- (4) R.L.D.—Surgeon Lieutenant F. M. Kyte.

PROMOTIONS:

To Surgeon-Rank Admvs C. M. Baker, D. R. G. H. G. D. S.

TRANSFERS TO THE PERMANENT SERVICE:

Surgeon-Lieutenants C. H. Baker and I. M. MacLennan; Surgeon-Lieutenants G. J. N. Gregory and P. C. Wrigley.

ENTRIES FOR SHORE RESERVE COMMISSIONS:

F. A. Johnson M.B.B.S., 1 M. Baker, M.B.B.S.C.H., 2 F. Lupton, M.B.B.S., M.R.C.S., L.R.C.P., D.F.R. Mackay M.B.B.S., A. J. Reilly M.B.B.S.C.H., J. A. Reid D.R.M., D.T. Chisholm, L.D.S., J. E. Sedgwick, F.D.S., L.D.S., G. B. Railton, F.D.S., L.D.S., P. Robertson, L.D.S.

RETIREMENTS:

Surgeon-Vice-Admiral Sir Cyril May.

Surgeon-Commander W. W. Jenkins.

Surgeon-Commander (Dr) W. J. Weston.

WARRANTHOLD OFFICERS:

PROMOTIONS:

Promoted Warrant Officer Lieutenant—L. K. Rose, and K. B. Avery.

RETIREMENTS:

Warrant Officer Lieutenant M. C. Morris.

QUEEN ALEXANDRA'S ROYAL NAVAL MEDICAL SERVICE

PROMOTIONS:

To Surgeon-Major-Rank—Miss K. P. Anderson (M.B.B.S.), Miss D. M. Chinnock (M.B.B.S.), Miss R. J. Head (M.B.B.S.).

TRANSFERS TO SHORE STAFF:

Murphy, Sister (Miss M. G. H. Edwards) (M.B.B.S.)

ENTRIES FOR SHORE SERVICE:

Misses C. M. Green, D. A. Hobson, J. Taylor, M. C. Tucker.

RETIREMENTS:

Miss A. M. T. D. Hardy, A. B. B. C. (Superintendent Sister-In-Charge) (M.B.B.S.)

ROYAL NAVAL MEDICAL CLUB

It was reported that the Royal Naval College, Greenwich, is not available for the Annual Dinner 1961 on any Friday. After considering many possible alternatives, the Club Committee decided that the website and financial advantages of Greenwich were such that Members would prefer to hold the Dinner at Greenwich on a different day rather than go elsewhere on a Friday. The date of the Dinner has therefore been fixed for Monday, 14 May.

ADMIRALTY DIRECT ORDERS—1948

(This page is preferred for future reference)

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131—Medical Evacuation by Personnel who volunteer for Service in Nuclear Powered Submarine.

132—Medical—Except—Offered Inpatient Power.

133—Medical—Units for Industrial Disease Consider Sent to Hospital

134—Medical—Incurable disease—Provision for Dr.

135—Radiation Hazards—Provision for Protection of Personnel concerned with use of X Ray Equipment or Radio Active Materials

136—Medical—Vaccination and Immunization

JOURNAL

The Editor retains the full rights to read or copy it, copy, or permission to do so, except personal expenses, i.e., fees of men and material of value to the author and service will be expected from them and establishments in India and Foreign countries. Names of books, messages and drafts are entered free of charge in publications.

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The Author's name should be supplied for bibliographical references; these references being arranged in alphabetical order of the author's names at the end of the contribution, thus "Smith, F. G. (1951) *J. Roy. Soc. Med.*, 44, 53". In the text a reference to a publication should be cited by giving the author and in brackets, the date that "Smith (1951) believed that it to be true." etc.

The Journal is published quarterly. Four numbers comprising one volume.

Articles and communications may be sent to the Editor at any time. They should be clearly written on, preferably, typed and sent as duplicates to The Editor, B.M. Medical School, Alwaras, Mysore.

Subscriptions

For B.M. and B.M.V.R. medical personnel on the rates of reduced 30/-, and to Contributors to the Royal Navy the subscription is 2/- per issue (avoirdupois pounds) for delivery of each year. Single copies 1/-.

For dental officers in the above categories the subscription is 1/- per annum (avoirdupois pounds). Single copies 1/-.

For all others who are not in the above categories the subscription is 2/- per issue (avoirdupois pounds) of 1/- per single copy.

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The payment of subscription by instalments is recommended as it relieves the subscriber of the necessity of forwarding a cheque with each and duplicate the keeping of it.

All Applications for advertisements to be made to

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B.M. Medical School, Alwaras, Mysore.

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Royal Naval Medical Service

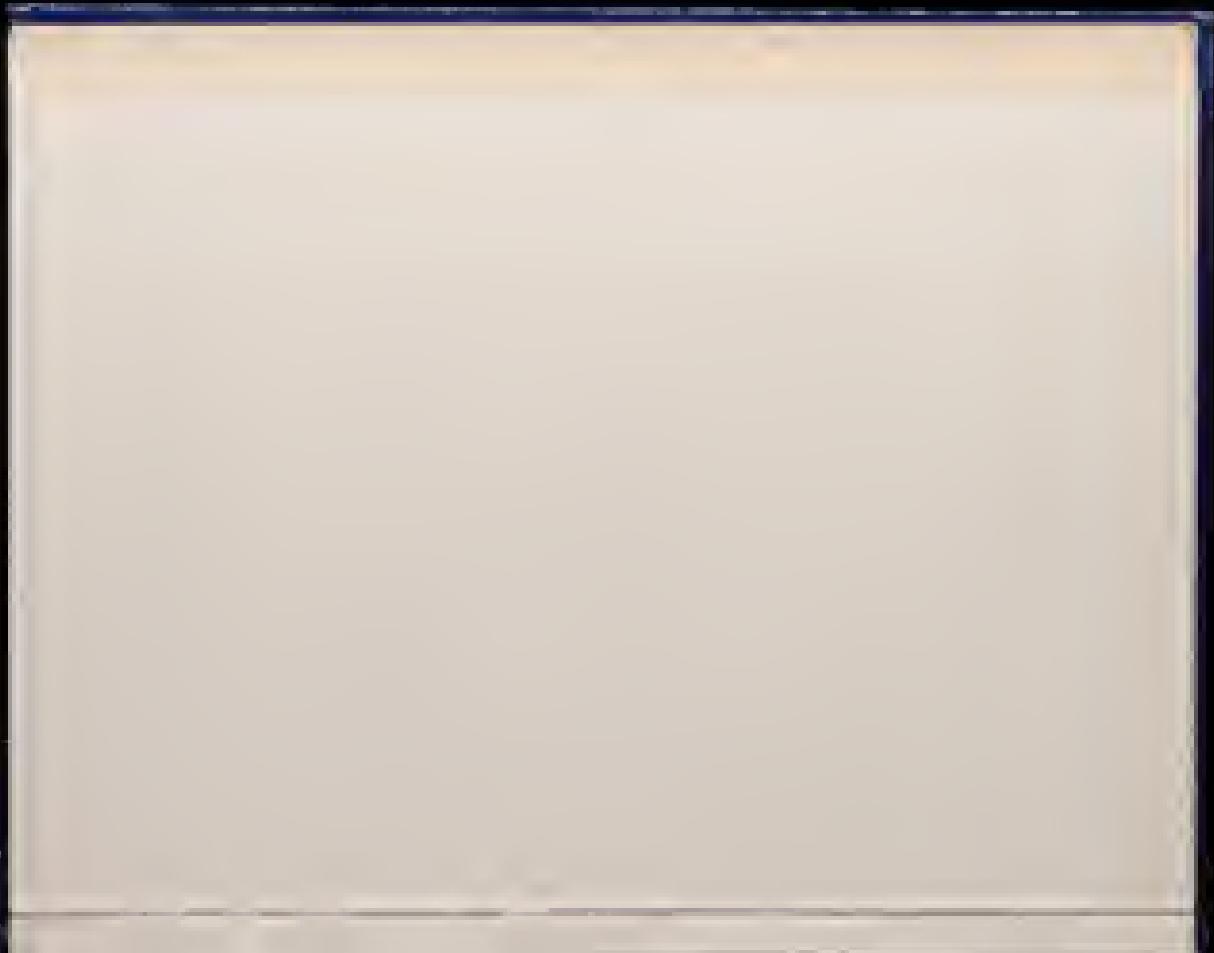
PUBLISHED QUARTERLY

(The Admiralty does not accept responsibility for the opinions expressed in this Journal.)

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ISSUE NO.

THE STAFF OF THE ROYAL NAVAL MEDICAL SCHOOL,
SLIPPERIDGE, HAMPSHIRE



Obituary

THE JOURNAL OF THE ROYAL NAVAL MEDICAL SERVICE, our sport from the Medical Branch of the Navy has suffered the loss of their distinguished and loyal supporters during recent months.

Reference to the late Mr Gordon Gordon-Taylor and Mr Harold Gilkes have been amply published elsewhere so that there remains little for us to add save that we deeply mourn their passing.

We are also greatly saddened by the death of Surgeon-Rate Admiral W. L. Martin at the age of 88 years.

The Journal of the Royal Naval Medical Service was closely linked with the late Admiral Martin by virtue of the fact that he was its first Editor. Almost until the day of his death he continued to display an otherwise interest in the progress of the Journal and he maintained a lively and sometimes most continuing correspondence with the Editors, never hesitating to congratulate or censure them according to current circumstances.

In a letter to us dated 12th May 1959, written in a firm hand, he wrote:—
Perhaps you will be interested in a little of the early history of the Journal. In 1913 Sir Humphrey Robinson Naval Consultant Medical (R.N.M.) suggested to me (then Aiding to M.D.C.) that the Royal Navy should have a Medical Journal. Not thinking that I would have the brain of forming the Journal, I conveyed Sir Humphrey's suggestion to Sir Arthur May (then M.D.C.). He approved and appointed Surgeon Commander R. C. Munday and self as first Editors. Surgeon Commander (then First Surgeon) Munday was called at the Admiralty as he became the first M.D.C. of the newly formed R.F.C. So the formation of the Journal fell to me.

"It was an excellent time to introduce a Journal! The Medical Service of the Royal Navy having doubled in the Great War. Many Temporary Surgeons became permanent and the Journal immediately became popular."

In this same letter Admiral Martin warmly congratulated the present Editors for what he considered to be a great improvement in the quality of the Journal and its contents. In our reply we readily admitted our many shortcomings but explained in detail the financial difficulties which were attached to the maintenance of any Scientific Journal in modern times.

Admiral Martin wrote to us again on 17th May 1959. Once more his letter expressed sentiments which were characteristic. He said "I am afraid that I was too rude". Thus, he added almost as an afterthought, "Of course I will continue to support you".

We repeat that the example of loyal support of the Board which is displayed by so many retired Medical Officers should nevertheless be rare in the case of a large number of serving Officers. Many of our present directed subsections may be surprised to know that 120 serving members of the Medical Branch of the Navy do not feel so free support. Neither are these subsections confined to the more junior ranks. That such a lamentable state of affairs should continue to exist is indeed a mystery which can hardly be explained by the conjecture that like the ruler of the f., nothing is quite the same as it once used to be?

SERVICES

THE GILBERT BLANE MEDAL.

BY

Surgeon Captain J. L. S. COULTER, R.N.

Sir Gilbert Blane was born in Ayrshire in 1749. He became a Doctor of Medicine at Glasgow in 1775 and, soon afterwards, became personal physician to Admiral Sir George Rodney in his Flag Ship H.M.S. *Reindeer*. A few months later, in 1779, Gilbert Blane was appointed Physician to the Fleet.

Although Blane was frequently the object of adverse comment by many serving Naval Medical Officers at that time, the reason being that he had achieved his position chiefly through a system of patronage, nevertheless his knowledge was profound and his ability of the highest order. His efforts devoted to the task of improving the health of the Navy and he instituted a number of reforms which he advocated in his famous "Memorial to the Admiralty" dated 1781.

In 1795 Blane became one of the Commissioners for Cork and Waterford and within a year had implemented the recommendations and discoveries of James Lind, many years before, in relation to the prevention of scurvy.

Blane resigned his appointment as Commissioner in 1802, though still continuing to exert great influence over medical policy in the Royal Navy. His work was rewarded by the knighthood conferred upon him in 1811.

During his career Blane was elected a Fellow of the Royal Society. He also held the posts of Physician Extraordinary to the Prince of Wales and also Physician to the Duke of Clarence, George IV and William IV. He died in 1834.

In 1839 Sir Gilbert Blane established, with the sanction of the Board of Admiralty, a Fund to provide a pecuniary prize in the form of a gold medal and which would be awarded to selected Naval Surgeons.

The original regulations governing the award of the Gilbert Blane Medal dated 2nd March, 1839 were set out as follows:

"I. The Founder considers it his duty to direct to the advantage of the Public Service that no award should be made among the Medical Officers of the Royal Navy by Ministry Circular to his professional merit. He directs the sum of One Hundred Pounds to the Trustee for the Discretion of such Association, in the

Complaint of the Royal College of Surgeons of London to Their Lordships which shall be from time to time, respectively. For the purpose of confirming, rectifying or repealing Two Gold Medals of equal value in two Standard Officers, Surgeons, or Regius Professors in the University of Cambridge or Assistant Surgeons of King's Ships in Commission and Honorary Surgeons, which in the time required shall have delivered unto the proper officer, persons answering the names annexed, proofs of their discharge respectively, and delivery to the members of their Professional Bodies. These Journals to be delivered in the form in which they have been kept hitherto, so as to give notice the symptoms in any case where medical advice may be required, and the name of the person making such observations, printed or stamped on them, so they may judge proper to make of them.

2nd.—The first Rebutions to be made by the Madrid Congressmen, on the 10th August 1811. Which the Madrid delegates before the 12th of July 1812 and the 1st of July 1813.—All former Rebutions, to be made under 1st August, as in the interval of time between each other from the Delegates delegated in the two preceding Years, or in the 1st of July immediately preceding each Rebution.

And in the Relation of these Journals the Founder proposes that the Majesties Commissioners of the Navy shall set out of the whole Amount delivered to them on the same of the several Years above specified, as also of each of all their Indigent persons the highest degree of merit, in number not more than ten per Year, for the sum which shall be appropriated by the Founder during his life time for his Relievers and of the number to consist of two or three, at least three should not be less than sufficient even if the Author or Author of which or his Indigent, may be more deserving of the Place. And after his death, the said Journals to be conveyed to the President of the College of Physicians who shall also administer, as in consequence thereon the Proceeds of the College of Physicians and other proper deliberations the said Presidents are to call in their executive the Senior Medical Commissioners of the Royal Navy and jointly with him select from the best Journals one of them, the Author or Authors of which is to be given of the reward of the persons the highest merit, and brought thereby created in the said Hospital or Medals. The said Majesties Commissioners adjudged are to be present on the hands of the standing Medical Commissioners so as by him presented on the appointed Dayes or Weekes. All the Journals of the first before to be received, with the example of the Medical Commissioners.

"Mr. In case of the impossibility of performing the before-mentioned. Please
through the offices of the postmaster directed to the postmaster directed the day in
duration as the time in each hour on the lower Cancer of the College of Physicians
the vice-president of the College of Physicians or the Board of Student Government.

20. It would be difficult to expect at any of the periods of Administration that in the opinion of the Foreigner or of the Peasants they have done what shall not be found in Foreign or Domestic Statutes to entitle any Candidate to the Post. It is stated in Article 11 that he who holds during the term of office of *Jalayashwar*, and the corresponding Magistrate, as to be entitled to such an office without remuneration and above those called in compensation to that period. But the regulation as to be so compensated and remunerated must be observed that these Posts shall be assigned during any one period, and if the unassigned *Mohar* should exceed the number, then either a man may be sent to the South, or a man by the Masters of Trade of Fifteen.

"Sir. In case at any time the Portuguese or the two Presidents shall need or make the despatchmen for a long period that these goods may still be considered as having reached their right and the ultimate wharves shall devolve on the local Commissioners who in case of default of course may call in such a referee as they may under circumstances require.

Mr. The President shall propose and agree with the Royal College of Surgeons for the amount for the medical fees which shall cover the Institute to be charged.

at the periodical periods and to be delivered to the Medical Commissioners or be presented to them at the annual Conference.

(iii) The annual Conference to sit not less than once a year.

(iv) The President of the Royal College of Physicians and Surgeons and the Senior Naval Commissioner to be appointed as Officers of the Board and its respective Administrators.

(v) In case any of these Surgeons whose Journals have been printed should be sent off previous to Administration, or they should have been appointed to Hospital or any other situation in their capacity that of Medical Commissioners, such Surgeons shall be deemed eligible. And also for the usual or case of absentees. May

(vi) After a time of not less than two years from the election of the President it shall be necessary for the Presidents of the two Royal Colleges and the Medical Commissioners of the Navy to hold an interview for the purpose of consulting, what they may and what addition or alteration would be appropriate in the present Plan and Regulations, and in such time as soon as this has been arranged for the Medical officers responsible for the supervision of the Naval Hospitals, or the Commissioners for managing the Office of the Lord High Admiral.

In addition the Founder submitted to the Board of Admiralty the following suggestions and recommendations relating to the award of the medals:

In That a Book be kept in the custody of the Medical Commissioners of the Royal Navy, wherein it is to be recorded the First and Regiments and so serve also in a Record of the periodical Administrations, and wherein not only the Name of the appointed Commissioners may be recorded but also of all those of the last Service, having either a name or initials, that there will be found tokens of same which may go without their due reward from the latest number of Books, and all of whom well of course possess a considerable share of merit above the ordinary, and be deserving of distinction.

That That Book be inscribed with the Name and address, or any brief extract of the corresponding Commission and duration of those appointed to manage the Medals, and a book may prove a source of much valuable information not only for the service of the Navy but of the Country at large, while it will open a source of liberal and useful information between the Members of the different public Professional Institutions of the Empire, provided some degree of publicity should be given to them.

The Board of Admiralty agreed with the suggestions, and recommendations, in accordance with the following letter:

"Admiralty Office 2nd March 1830

Sir

My Lord Commissioners of the Admiralty having referred to the Commissioners of the Victualling your letter of the 2nd of last month — I have been long since anxious to acquaint you that your proposed plan for the disposal of the Medals for the advancement of Medical Science in the Royal Navy, made by the 10th of this Board, and will be brought forward into effect

I am Sir

Your most obedient Humble Servt

Captain John Bulwer

Captain John Bulwer
Secretary

In accordance with these regulations drafted in 1830, it was intended to confine all the Journals of Naval Surgeons by the 12th July, 1831, and

awarded two medals to the surgeons considered most worthy, on 11th August of the same year. However, there was a period of delay occasioned by the senior employee to design the original Gilbert Blane Medal, so that the first awards of the medal were not made until 2nd March 1832.

As has always been the case subsequently in connection with the award of Prize, the award of the first two Gilbert Blane Medals in 1832 was arrived at by virtue of a prolonged and searching system of selection. In July 1830 238 Journals compiled by Naval Surgeons were delivered to the Admiralty, each Journal covering a period of the last five years of service by the writer. After these 238 Journals had been scrutinised in the Admiralty 50 of them were short-listed and the Journals were sent to Sir Gilbert Blane himself from whom he was required to perform the difficult task of selecting the two Journals considered most worthy to bring the award of medals to the Surgeons who had compiled them.

The names of the 5 Surgeons whose Journals were short-listed for scrutiny by Blane were:

- Dr John Lubell of the ship of 14 Guns
- Dr William Donnelly of the Ship of 44 Guns
- Robert Parker, Midshipman, of the ship of 74 Guns
- Dr George Court of the Friggy of 44 Guns
- William Martin, Midshipman, of the ship of 74 Guns
- Dr John Wilson of the Frigate, of 36 Guns
- Dr John Horatio of the Friggy of 32 Guns
- John Stevenson, Midshipman, of the Frigate 74
- John Trollope, Midshipman, of the Frigate 74

After considerable thought Blane selected for the first two medals Dr John Lubell of the *Aurora* and Dr William Donnelly of the *Maeander*.

Blane marked the importance of the occasion by commenting on dated upon Naval health in general and upon the issues which had led him to doubt in favour of Dr Lubell and Dr Donnelly in particular.

Remarking that it might possibly be alleged in dispraise of the Foundation of the "Gilbert Blane Medal," the Founder reminded the Board of Admiralty that it so happened that the first awards were being made in a time when the preservation of the health of sailors had never been so well understood nor had secured such strict and regular attention. For this reason it seemed to him that the award of a Prize to doctors for preserving the health of seamen might well appear unnecessary. Nevertheless, Blane emphasised that there was always a danger when things were going well that a placebo might be relaxed and that methods recently introduced might easily pass into desuetude. What he feared most was that improvements in health might result in future complacency. Observing that the incidence of scurvy was also reversed of what it had been, that floors were rarely considered that there was a preposterous assumption of superiority and a comparative absence of virtue, therefrom should constitute a most cogent reason why the excellent sanitary legislative provisions so lately introduced into the Fleet should never be forgotten. Therefore on Blane's opinion the existence of his medals

should pass down to posterity as a distinct standard in Naval Surgery to maintain the health of the Navy at the highest possible peak and should at the same time represent an academic form of recognition with which these efforts might be rewarded.

Dr. Lubdell, who the Founder placed first of the two successful candidates, was Surgeon of the Asia of 44 guns. Asia had been Flag Ship in the Blockade of Navarino on the 20th October 1827 and Dr. Gilbert Blane was greatly impressed by Dr. Lubdell's account of the arrangements which he made in preparation for that particular battle. Blane considered that those arrangements were not only extremely judicious but argued a commendable and anxious foresight under the dictates of a calm and rigorous sense of duty. In particular Dr. Lubdell's method of forming a commissariat impetrated valid by the convenience of placing the main tables on the Midshipmen's Deck was not lost sight of but he noted as did Lubdell's brought in preceding numerous journeys for the amateur arm of the service. In addition Lubdell also proved himself to be well aware of current thought concerning the subject of immediate amputation in order to save life and suffering at the expense of a discharged limb. This was a subject of some professional controversy between Officers of the Army, and Officers of the Navy with immediate amputation being recognized as a method most likely to achieve successful results since it had first been advocated by Baron Larrey Surgeon General to Napoleon's Armies. In addition to his surgical insight and acumen, Dr. Lubdell also proved considerable credit for observing the newly recommended contraindications for securing ventilation and circulation in the cockpit thereby alleviating the suffering of the wounded.

The other successful candidate was Dr. William Donnelly of the Rover of 44 guns and the prominent branches of medical practice with which he had been involved, and which had attracted the notice of the Founder were the nature and treatment of syphilis and acute rheumatism. In the case of syphilis Dr. Donnelly had applied himself to a statistical survey of the aspects of that disease. An ingenious acute rheumatism, Dr. Donnelly had not confined his observations to anterior manifestations but had extended his investigations towards a minute record of the organic effects of this disease upon the heart and lungs. Blane described these latter views of Dr. Donnelly as "Drawn up by [one] with much anatomical precision indicative of superior information."

Although Dr. Lubdell and Dr. Donnelly were selected for the award of the first two Gilbert Blane Medals, the Founder resolved his tribute to a number of other candidates who had been short listed. In fact, he went so far as to express his painful and serious regret that there should not be a greater number of medals or other tokens of appreciation for other candidates who had clearly and fairly merited distinction by their great skill, diligence and humanity. Mr. Parker Hulme of the Albion was commended for the unusual degree of health in his ship and his exemplary attention to cleanliness and ventilation. Dr. Wilson of the Rattler was commended for his judgment

and accurate medical documentation as well as for his knowledge of accouches and Mr. Martin of the *Asia* deserved favourable comment for his interesting observations on the subject of an epidemic of Indian cholera. Dr. Blane of the *Vulgaris* was also commended though somewhat vaguely Blane noted with approbation the persevering efforts of the Medical Officer to "A private patient in Liverpool". Rose observed that this was an example of "how little ingenuity, say how industrious private practice may be occasionally practised by those engaged in the public service of the profession". Dr. George Green of the *Fame* was complimented on his investigations into cases of ruptured duodenal and Blane added his own remarks to the effect that "some young ignorant clowns, conscious of having exposed themselves to the reverent infliction could not be conscious of their not labouring under it, even by these Medical attendants who found no symptom of it". Mr. Harrison of the *Dubai* and Mr. Tait of the *Albion* were also recommended by the Founder.

Sir Gilbert Blane concluded his account of the course of selecting the first two annual medallists for his medal by remarking that there ought throughout the Journals which he had quoted, a due sense of conscientiousness for honour sufficing with an evident desire of achieving it. Finally, Blane resolved that he was unlikely ever again to have the opportunity of adjudicating the awards. "Having arrived at the third year of his age and labouring under a variety of various infirmities with little hope of again performing this duty, he will give with the warmest sentiments of unfeigned regard and best wishes for the continuance of the responsibility and welfare of the Medical Officers of the British Navy only say to these 'Valete Vos'."

In 1813 owing to the advanced age and infirmity of Sir Gilbert Blane the task of adjudicating the award of the Gilbert Blane Medal was delegated to the President of the Royal College of Physicians, President of the Royal College of Surgeons and the Physician General of the Navy. This method of selection and the rules and regulations governing the award remained unchanged until 1863. On 7th May 1863 the Board of Admiralty agreed that the regulations should be altered on the grounds that owing to the great change that had taken place, not only in the constitution of the Naval Service itself but also in Medicine, Surgery and allied Sciences, the system of conferring the Prize Medals no longer conduced to that advancement of the Public Service originally intended by the Founder. Under the new regulations it was arranged that the adjudication of the medal should now be based on the results of Surgeon's Professional Examination and that one medal should be awarded annually to the Medical Officer obtaining the highest aggregate marks in the examinations for promotion to the rank of Staff Surgeon. Also should it happen that no Medical Officer should pass a sufficiently satisfactory examination to entitle him to the award of the medal, then the award should be held over until the following year, though no more than two medals should ever be adjudicated every year. At the same time should the unadjudicated medals over exceed four in number their value was to be given to the Bazaar-mall Fund for the children of Medical Officers.

These new regulations were approved by the Board of Admiralty on 2nd June 1913. However, the First World War intervened so that no award was made under the new regulations until over two years had passed. Then, on 26th May, 1917, a special adjudication was approved for the war period. Owing to the war and the unusual conditions which followed the war it had proved impossible to hold a promotion examination before February 1917. After awaiting the result for 1912 under the new regulations, which had been evolved in 1913, there still remained 7 medals unawarded. The remaining seven were given from the Fund during the next two years, one going to the Naval Medical Correspondence Fund in November 1918. This meant that 9 medals remained to be awarded in 1921, and after careful consideration it was decided to award these medals to the three Naval Medical Officers whose work during the war and throughout their Service careers had displayed the most outstanding qualities for the performance of duties with special reference to Naval life.

The selection of the three Naval Medical Officers on the occasion of this special adjudication was a matter of grave deliberation on the part of the Presidents of the Royal Colleges and the Medical Director General of the Navy.

In due course the result of the special adjudication was published in the following terms:

"The names of the following officers having been under my consideration are:

Robert W. B. Hall
Stephen F. Stanley
Harold G. S. Bond

Henry C. Williams
Peter L. R. Stephen

We have adjudged the medals placed at my disposal to

Surgeon Commander Robert W. B. Hall

Surgeon Commander Stephen F. Stanley D.F.R.C.S. M.D. D.P.H.

Surgeon Commander Harold G. S. Bond M.B. F.R.C.S. M.R.C.P. D.P.H.

Harold G. S. Bond, President of the Royal College of Surgeons;

Stephen A. Bowley, President of the Royal College of Physicians;

Robert Hall, Medical Director General of the Navy.

In 1931, 1932 and 1933 there was a temporary lapse of promotion courses. The result being that no Captain (then Major) was awarded. However, it was decided to award two medals each year from 1934 to 1936 (subject to the promotion results justifying double awards in those years). In fact, one medal was awarded in 1934, two in 1935 and three in 1936.

In 1936 the regulations governing the award of the Collier Blane Medal were again altered, the reason being that it was the general opinion in the Medical Branch of the Navy that the existing method of making the award the subject of the result of the promotion examination was no longer satisfactory, as such a system did not always ensure that the award was received by the most worthy Medical Officer. Among other objections which were raised to this alteration the objection was the fact that then the rate of the Blue Admirals was in 1935, amongst engineers of the Service had prevented a number of serving Medical Officers from taking part in the promotion courses and examination.

The new regulations governing the award were now framed as follows:

—The Calvert Blue Medal

1. In 1920 the late Mr Calvert BEM, Royal Navy a member of the Board of Health and Medical Services, was knighted with the sanction of the Board of Admiralty at a formal ceremony in the presence of Prince Edward, Duke of Kent, which is recorded in the *Corporation of the Royal College of Surgeons of London* as follows:

2. This jewel is intended for the purpose of acknowledging a Gold Medal on the Medical Officers of the Royal Navy who, as a doctor whose professional service of long years has brought about or rendered in any branch of Medical Science in its application to Naval Service, or has contributed in any way affecting the health or living conditions of Naval personnel.

3. In acknowledging the award of the Medal consideration will be given to achievement by Medical Officers in research, in original studies and reports, compilation of a series of services, character of working conditions, and information which is brought to notice of work performed or brought to notice by Medical Officers within the scope of the Regulations governing the award of the Medal as stated above.

4. The Medal shall be awarded annually unless it is considered no officer has qualified for the award, in which case the Medal is to be withheld until the following year when if considered suitable to do so, it shall be given to an additional named.

5. Medical Officers of all ranks shall be eligible for the award, and an officer will not be awarded to two using the Medal on one occasion only during his career.

6. If the recommended Medal cannot bear the name of the medals or name of the member shall be given in the signature of F.M.D.

We consider that the method of application = II does closely coincide with the work of the Faculty of the Board and that by a recognition will be to those officers who have enhanced the physical welfare of the Navy and enhanced the prestige of the Naval Medical Service.

respectfully yours of Yours, President of the Royal College of Physicians,

respects Calvert Walker President of the Royal College of Surgeons,

respectfully yours of Yours, Medical Director General of the Navy.

These new regulations were approved and published in A.F.O. 175/36 and may have remained in force since that date.

From 1932 to 1962 Calvert Blue Medals have been awarded to the following 120 Naval Medical Officers:

1932	John Lubell	1933	B. T. C. Brett
	John Watson		James Stirling
1933	John Wilson	1934	Alexander Armstrong
	R. J. Miller		Charles D. Brett
1934	Edward Evans	1935	W. H. S. Evans
	Ernest Bryan		A. J. Shirley
1935	William Adams	1936	William Davis
	Charles MacLean		Walter Fletcher
1936	Archibald McAllister	1937	C. G. Reid
	James H. R. M. E.		William Fletcher
1937	E. J. McAllister	1938	Andrew Christie
	John Tait		Arthur Carter
1938	William Hunter	1939	William H. Angus
	Albert A. Sturt		Frederick Fletcher
1939	T. A. Clark	1940	John Jones
	J. Wrayton Fletcher		Henry Fletcher
1940	Paul Linstead	1941	Alexander Fletcher
	Henry P. Malone		G. L. Morgan
1941	F. A. Williamson	1942	G. McNeill
	Frederick Marshall		H. C. T. Lawrence
1942	George Milner	1943	G. D. Mansfield
	—		Thomas J. Price

RADIOACTIVITY

By

Institute Lecturer-Chemist B. W. CRAVEN, B.Sc.

In this issue of *Woolmark Science* will be made an attempt to explain the phenomenon of *radioactivity*, but more particularly *nuclear radioactivity*, so that others will have a better understanding of the problems involved for subsequently evolving more accurate explosives and nuclear power reactors. It is hoped that the article will serve as a basis of understanding for those medical officers whose knowledge of physics may be described as "somewhat rusty."

The first stage to understand is the modern view on the structure of atoms and this article is an attempt to do just this. Although the history of the discovery of the various particles that are considered to make up the atom is very fascinating no need start by stating boldly that there are three main constituent particles of atoms, namely electrons, protons and neutrons. There are other particles also, but these are so short lived that they are not considered to be fundamental in the sense that electrons are. Such short lived particles are positrons which may be considered as positive electrons and various kinds of mesons or middle mass particles. Theory also demands the presence of particles called neutrinos which have very little mass energy but which have energy of motion and spin. Electrically they are neutral.

Electrons

These tiny particles were first really understood at a result of the researches of Professor J. J. Thomson about 1899. They are liberated from atoms in various ways, e.g. by heating, by bombarding surfaces with light and other radiations of fairly high energy and by other devices and by the pull of nearby large positive charges. These particles are considered to be the particles that flow from atom to atom in an electrical circuit to give an electrical current under the electrical pressure or voltage applied to the circuit. It has been experimentally demonstrated that the electron is negatively charged and that the charge on the electron is a fundamental charge equal to 4.80×10^{-10} esu's stat. units (coulombs). The size of charge is, that charge which placed 1 cm away from a similar charge in vacuum experiments a repulsive force of 1 dyne (the dyne being the force that gives an acceleration of 1 cm/sec.² to a mass of 1 gramme). A more practical unit of charge is the Coulomb which equals 3×10^{19} coulombs and is that quantity of electricity which flowing past a given point in an electrical circuit generates a force of 1 dyne/cm². From the above it can be seen that this means that the electron has a charge $e = 1.6 \times$

1.60×10^{-10} Coulombs. This figure is all we can say at present, i.e. it leads to an enormous range and, namely the electron volt (eV), which will be dealt with in a later article.

The mass of the electron is 9.108×10^{-31} grammes, while that of the hydrogen atom the hydrogen atom is 1.673×10^{-24} grammes, i.e. nearly 2,000 times as big. The mass of the electron will therefore be given in my calculations later below.

In nuclear physics the unit of mass is taken as one thousandth of the mass of the oxygen atom. This unit is called the atomic mass unit or m_u . Its value in grammes is approximately 1.67×10^{-24} i.e. nearly the mass of the hydrogen atom which can be taken as $1 m_u$. Then the mass of the electron is $0.0001 m_u$. In the simple calculations in these articles these values will be used, but it must be remembered that they are not exact; they are exact only to the fourth place of decimals and they are the *true* ratios i.e. the masses of the particles while they are travelling slowly.

The diameter of the electron is of the order of 10^{-10} cm. or 0.00001 Angstrom units, an Angstrom being 10^{-10} cm. The diameter of the atom of hydrogen is of the order of 1 Angstrom unit so that the electron is very small in comparison with the hydrogen atom.

Proton

This is a positive particle, the charge on it being equal to the charge on the electron but opposite in sign. Thus a proton and an electron make a neutral pair. The mass of the proton can be taken as being nearly that of the hydrogen atom, namely $1.673 \times m_u$. It follows then that the hydrogen atom a neutral particle, and consists of only one proton and one electron, the electron being very remote from the proton.

Neutron

This is a neutral particle having a mass of $1.67500 \times m_u$ (i.e. 1.675). Although its possible existence was forecast by Rutherford in the early years of the present century, it was not discovered until 1932 by Chadwick. This was because having no charge, its presence was difficult to detect.

The Alpha Particle

Alpha particles are the greatest parts of helium atoms and are given off by some radioactive elements. While bombarding gold leaf with alpha particles Rutherford, Geiger and Marsden discovered that some alpha particles are bounced back, which was about as incredible as if you had fired a rifle with shell at a pair of iron paper and it had come back and hit you. This phenomenon was explained by assuming that most of the mass of the atom is concentrated in a central massive nucleus which is positive and therefore repels all the protons. The few alpha particles which bounced back must therefore have hit the much more massive gold nucleus. Mosley, whilst working in Rutherford's laboratory in Manchester, observed that two common neighbouring elements in the Periodic Table of elements, they differ from each other by one positive charge on the nucleus. Thus Hydrogen, the first element in the

table has a single positive charge on its nucleus. In fact, the proton has a little more positive charge between the third electron and the fourth, charge递增 up to within the twenty-second electron, which is exactly two positive charges on its nucleus. The number of protons in the nucleus is given, therefore, by the number of the element in the Periodic Table. This number is called the Atomic Number of the element and gives the symbol " Z^+ ". As the atom is neutral the proton in the nucleus must have other charges, denoted "the net equal number of planetary electrons." There are good grounds for believing that these electrons do not normally exist in the nucleus, although they can be driven off from the nucleus as will be described later.

As the weights of neighbouring elements differ by more than 1 and there are only more the nuclei increase by one proton from element to element, but also by one or more neutrons as well. Thus the hydrogen atom contains a single negative proton in its nucleus, with no electrons near distance away, the helium atom four times the weight of the hydrogen atom has two protons and two neutrons in its nucleus and two electrons some distance away from the nucleus. The general scheme for the structure of the lighter elements can be seen from the following table:

Element	Z^+	N	No. of protons	No. of neutrons
Hydrogen	H	1.0000	1	0
Helium	He	4.026	2	2
Lithium	Li	7.040	3	4
Boron	Be	9.041	4	5
Boron	B	10.051	5	5
Carbon	C	12.060	6	6
Nitrogen	N	14.064	7	7
Oxygen	O	16.060	8	8
Fluorine	F	19.060	9	10
Sodium	Na	23.051	11	12
Magnesium	Mg	24.051	12	12
Aluminum	Al	27.051	13	14
Silicon	Si	28.050	14	14
Phosphorus	P	31.055	15	16
Sulfur	S	32.050	16	16
Chlorine	Cl	35.057	17	18
Argon	Ar	39.054	18	20
Potassium	K	39.050	19	20

Look through the elements in their order in the Periodic Table.

The above table is of some interest in that it shows that most of the elements have, at least weight, in the neighbourhood of whole numbers, but some like chlorine do not. This is because the atoms of chlorine are not all alike in that some have fewer neutrons in the nucleus than others—that is why a space under "No. of neutrons" in the table has been left for chlorine. One species of chlorine nucleus has 18 neutrons, while the other species has 20 neutrons. Each type of chlorine has the same number of protons and electrons and is, therefore, indistinguishable chemically from the other type as the chemical properties of

elements depend on the number and arrangement of the electrons outside the nucleus.

The two kinds of chlorine are called chlorine isotopes, a name given by Soddy to different types of atom occupying the same place in the Periodic Table but of the same element.

Further investigation into the distribution of isotopes among the elements shows that nearly all elements have isotopes and that one of the reasons why atomic weights are not whole numbers is that the naturally occurring element is a mixture of isotopes whose average atomic weight is that which is usually determined. Thus chlorine normally consists of a mixture containing about 3 parts of the isotope whose atomic weight is nearly 35 and 1 part of the isotope whose atomic weight is about 37. The average atomic weight is then about 35.5.

Some 1,200 isotopes of the 102 elements are now known, and these isotopes are distinguished from each other by a special notation. First the atomic number determines the element whose symbol is written down. The different isotopes of the element are then distinguished by a superscript placed behind its symbol. This superscript is the mass number A , and it is the number of nucleons (protons plus neutrons) in the nucleus. Thus the two chlorine isotopes are written as Cl^{35} and Cl^{37} . Sometimes the atomic number is put as a subscript in front of the symbol; thus, Cl^{17} . From what has been said it will be seen that the difference between the sub and superscript is the number of neutrons present in the nucleus of that isotope.

Hydrogen is actually a mixture of two isotopes. One consists of one proton and one electron. The other isotope has a neutron with the proton to form a nucleus whose mass is twice that of the first isotope nucleus. The second isotope is called deuterium and like hydrogen it has a single electron in its atom. Theoretically it should be identical with hydrogen in its chemical properties, but owing to the disproportionately of mass between the two isotopes deuterium is less chemically active. For example "heavy water," or deuterium oxide, is less easily split up on electrolysis than is ordinary hydrogen oxide. For most other elements the masses of the isotopes are much nearer to each other and the chemical properties therefore more nearly alike.

The presence of negative and positive particles in an atom suggests that the electrons cannot be stationary; otherwise they would be attracted to the nucleus and be neutralized by it. Rutherford therefore proposed that the electrons revolve round the nucleus in a somewhat similar manner to the motion of the moons of Jupiter round the planet, the force of electrical attraction being akin to gravitational attraction in keeping the electrons in orbit. There are however objections to this. If an electron were to move in this manner it would radiate energy in dipole magnetic waves in the same way that electrons in the accelerators involved in oscillating up and down a radio wave are responsible for the radiation of radio waves. As the electrons lose energy in this way they would slow down and as a result the inward acceleration towards the nucleus would exceed the retardation due to the curved path. Hence the

electrons should spiral into the nucleus. But no change of any resulting radiation changing all the time. This does not happen.

In order to overcome this objection and to explain various phenomena connected with the spectral lines of incandescent elements, Niels Bohr invoked the concept of energy quanta or parcels. This idea had been postulated by Planck in order to explain certain aspects of radiation. The basic idea is that radiation (i.e., electromagnetic waves) travelling at the speed of light does not have an infinite number of energy values, but is made up of parcels of energy, the energy in each parcel being defined by the equation $E = h\nu$, where E is the energy in ergs, where the frequency ν is oscillations or vibrations per second and h is a universal constant known as Planck's constant equal to 6.62×10^{-27} erg sec, taking into account the amount of work done in energy imparted when a light of frequency ν passes through a distance of 1 cm. Since $\nu = c/\lambda$, where c is the velocity of light (3×10^10 cm/sec) and λ is the wavelength of the radiation in cm, $E = hc/\lambda$.

According to Bohr electrons could rotate around the nucleus in two closed orbits and while doing so would not give off radiation. The orbits would then be stable. An atom can have one, or more of these stable orbits. Each orbit differs from the other orbits in the quantity of energy associated with it. The quantum of energy for any given orbit is defined by $E = -R\frac{h\nu}{n^2}$, where R is another constant whose value depends on the atomic number Z , h is Planck's constant and n is the principal quantum number associated with the particular orbit. n can have any whole number value from 1 upwards; it is the number of the orbit or radius given out from the nucleus. i.e. the nearest orbit has a value for $n = 1$, the next orbit has $n = 2$ and so on. Since work would have to be done on an electron in order to increase the force of attraction between itself and the nucleus, as the electron is moved to an outer orbit, the outer orbits are associated in any given atom with higher energy quanta. According to Bohr the characteristic spectra of elements consist, in electrons, from an outer orbit jumping into an inner orbit and so doing going to a lower energy level. The characteristic $E = E_0 - E_1 = \frac{h\nu}{n^2} - \frac{1}{n_0^2}$ (where E_0 is the energy level of the outer orbit denoted by n and E_1 is the energy level of the inner orbit denoted by n_0).

Assuming circular orbits, Bohr was able to calculate the radius of the orbital motion & the velocity of the hydrogen atom and his results agreed roughly with the diameter of the hydrogen atom, whose boundary is taken to be the electron orbit. He was also able to calculate the energy of an electron in different orbits and hence find the energy released when an electron jumps from an outer to an inner orbit. His theoretical figures agreed with the results of spectroscopic experiments. From the value of E so calculated and using the Planck equation $E = hc/\lambda$ or $E_0 = \frac{h\nu}{n_0^2} + \frac{1}{n_0^2}$, the values of λ can be found assuming values of n and n_0 and the results agreed with the wavelengths of the radiation from hydrogen gas whether being emitted at low pressure in an electric current or

distance. The wave-lengths calculated and experimentally observed are shown in table I in the visible light region.

The absorption spectra of elements show that the wave-absorbed energy of the wave-frequency as they move and the Bohr picture of the electrons give an explanation of this. If radiation has a given frequency or energy it is quantized by $E = hf$. If the quantum is of the order of the difference in energy between two orbits, then the electron in the higher orbit can be energized by the radiation and have sufficient energy to jump into the outer orbit. The energy absorbed is re-radiated when the electron returns to its original orbit. If the energy is absorbed from a beam of electrons, the beam loses energy and the re-radiated energy is in all directions and not only along the path of the beam.

When hydrogen gas is subject to a bombarding stream of electrons, the orbital electrons can be energized by the passing beam and escape from their orbits. It is possible to calculate what energy the beam electrons must have in order to do this and it is found that the calculations based on the Bohr picture agree with the spectroscopic results of the energized hydrogen gas, where several electrons are radiating energy again when they return to their ground state.¹

The process of emerging electrons in atoms which then radiate the energy absorbed change as they return to their original orbits is the basis of the emission of X-rays. The idea can also be used to account for the emission of gamma rays from the nucleus.

It might be as well at this juncture to mention that the modern idea of particles is that they have a dual nature. Sometimes it is convenient to regard them as particles, but at other times it is more convenient to regard them as wave-wave trains. That electrons can behave as waves is shown by the fact that they can undergo diffraction and give interference patterns in the same way that light waves can. On the nature of electrons it based the electron microscope whose resolving power is so much greater than that of light, because of the very short wavelengths of the electron-waves.

In a similar way vibrations can be regarded as particles or the energy quanta can be regarded as a succession of high energy "bullets". Each quantum is such a photon and in one direct direction one of atoms of a bar sufficient energy in the same way that bombarding electrons can.

In order to explain other known phenomena it has been necessary to even be to allow electrons other quantum numbers " l ", " m " and " s ". l can have any integral value from 0 to $n-1$. " m " can have any integral value from -1 to +1 and " s " can have either a value of +1/2 or -1/2. Without going deeply into the subject, it can be said that the older idea of orbits is being replaced by a picture of energy shells or areas where electrons of given energy are most likely to be found. In these shells electrons can move in differently shaped orbits. The shell next to the nucleus is the K shell and has $n=1$. If $n=1$, then the value of l and m must be 0 (these two quantum numbers indicate the kind of electron orbit in the shell and the angle of the plane of the orbit to an analytical meapns, field respectively). Using Pauli's Exclusion Principle, which states that an atom cannot have two electrons having the same quantum numbers, we

can not hold there 1 to 8 electrons, but only 1 to 2 because there are only 2 shells. Of these electrons, one will be spinning in the outer shell and the other will be paired. This is to say there must be 1 electron but at the helium atom there are two K electrons and this accounts for the inertness of the helium atom. Since it needs six or four electrons from other atoms in order to reach a stable arrangement. Hence it does not react with other atoms.

For the L shell where $n=2$, it can hold 1 to 8. When $n=2$, m=0 and l can be -1. Hence there are two electrons possible in the L shell with quantum numbers n=2 and l=-1. When l=1, m can be -1, 0 or +1 and for each of these, values s=+1. Hence there are 6 more the total of electrons having n=2 and l=1. This means that there are a maximum of 8 possible electrons in the L shell and the shell is filled when all 8 are present. In the periodic table after Helium comes the 2 elements Li, Be, B, C, Ne, F and Ne. It is believed that atoms of these elements fill up the L shell in successive electrons until the next gas begins to react when the shell is full. The next element sodium Z=11 has enough electrons to be filled in and it starts the M shell. The broad structure of the different types of atoms of the lighter atoms can be represented:

Hydrogen	K1	Helium	K2, L1
Hydrogen	K1	Neon	K2, L1
Lithium	K2, L1	Sodium	K2, L1, M1
Beryllium	K2, L2	Magnesium	K2, L1, M2
Boron	K2, L2	Aluminum	K2, L1, M3
Carbon	K2, L2	Silicon	K2, L1, M4
Nitrogen	K2, L2	Phosphorus	K2, L1, M5
Oxygen	K2, L2	Sulfur	K2, L1, M6
Fluorine	K2, L2	Chlorine	K2, L1, M7

and so on until the next inert gas Argon K2, L8, M8 is reached. After this comes potassium but its extra electron does not go into the M shell but starts the N shell. Thus potassium can be represented by K2, L8, M8, N1.

If $n=3$ the shell l=0, 1 or 2 and it will have the appropriate values for a given value of l. For example if l=1, m can be -1, 0, +1 or 2. From this it is possible to calculate how many electrons the third shell can hold. It can hold 18 electrons and in general the number of electrons a shell can hold is given by $4n^2$ where n is the number of the shell starting out with the nucleus.

It might be wondered why the potassium atom does not carry on in the M shell. This however is easier, from energy considerations for the last electron to go into the N shell than into a more energetic orbital the M shell. The M shell does fill up with the first ionization series of elements that come after calcium, K2, L8, M8, N2, namely scandium, K2, L8, M8, N2 to zinc, K2, L8, M18, N2. After zinc the N shell fills up to 8 electrons with the next gas krypton, K2, L8, M18, N8. It can be noticed that each of the next gases other than helium has an outer shell containing 8 electrons. This appears to be a stable configuration and in order to explain chemical bonding between atoms, one may in broad terms that each element strives to get an electron configuration similar to that of the nearest inert gas. Thus the alkali metals Li, Na and K would have an outer shell configuration of the Ne or Ar respectively of each could be released of a single outermost valency electron. If such was lost the

causing the resulting particle would have a single positive charge owing to the number of nuclear protons being unchanged and the lithium, sodium and potassium ions, Li⁺, Na⁺ and K⁺ would result. In a similar way the alkaline earth metals of valency two would become Be⁺⁺, Mg⁺⁺ and Ca⁺⁺ of each loss its two outer valence electrons.

On the other hand the vigorous non-metals like fluorine, chlorine etc. would reach the next stage of association, i.e. each could gain an electron as for example from the sulphur atoms. They would then become the negatively charged fluorine or chlorine ions, F⁻ or Cl⁻. In sodium-chloride solid or liquid the sodium and chlorine are in the form of ions held together by the attraction between the ions. Such a valency bonding is called a ionic linkage.

There are two other main types of valency bonding, the co-valency and the co-ion valency. In the covalency type of association of many diatomic compounds two electrons one from each atom are shared by the two nuclei. Thus methane, CH₄, can be represented



Other examples are hydrogen chloride gas



In the co-ion bond one atom gives both the electrons being shared and the results in each atom of the pair being charged. An example is found in the ammonium ion. Here the hydrogen of say the HCl gives its electron to the chlorine which then becomes Cl⁻ leaving the hydrogen as H⁺ i.e. a proton. This then attaches itself to the ammonia nitrogen atom where there is a "lost pair" of electrons to form the ammonium ion.



The sharing of the two electrons of the ammonium ion causes the distribution of electric charge within the molecule (i.e. delocalised) so that one part of the molecule is more slightly positive and another part slightly negative.

from the combined results of atomic structure theory and elements the atom is a stable system which can combine, form new bonds and remain or be dissolved from a group of shells by the absorption of quantum energy or be being knocked out by bombarding particles so follows that molecules can be broken up by radiation. This applies particularly to covalent compounds many of which are gases.

As will be seen in later studies there is good evidence for the belief that the nucleus has no protons and neutrons (nucleons) in energy shells and that the nucleus can be excited into different energy states by absorbing certain amounts of energy. When it returns to the ground state it may shed the excess energy as gamma rays or give off very short wavelength radiation.

Neutrons have a mass about 200 times that of the electron and are present in atomic radiation. They can have a negative charge and on being slowed down can be captured by an atom and go into a permitted energy level in the same way as orbital electrons. The combination of nucleus and negative neutron gives a resonance state. As the life of the neutron is short, so is that of the nucleus, then and as the excess jumps into other energy shells at lower energy values radiation of energy takes place. The energy levels for neutrons are much closer to the nucleus than are the electron shells and the energy released when various transitions take place between energy levels is of the order of Rabi X-rays i.e. of wavelength 0.1 to 0.0001 Angstrom units. Such X-rays are called resonance X-rays. There are reasons for believing that certain neutrons actually penetrate the nucleus and if they are neutralized there they are annihilated with the liberation of energy. This then leads to an excited nucleus.

**A PRELIMINARY REPORT
ON THE USE OF "ESKORNADE" IN THE TREATMENT OF
EUSTACHIAN BLOCK IN DIVERS UNDER TRAINING**

M

Sergeant Commander R. T. MINT, R.N.

Barotrauma block has always been a major complication in diving, and is one of the commonest causes of loss of men among divers. The development of shallow water diving during and after the Second World War has led to more pressure being required to keep air dives. Therefore the problem of control of block is of prime importance. The Training Courses are by necessity mass-produced and one of the main problems in the training of shallow water divers is that of a man fails to clear his ears in the first two days of the course he is unable off training and has to wait for another course; the very real suffering, many months and therefore great risk to drafting difficulties.

All would divers are selected from volunteers. They are medically examined at their establishment within ten days of being drafted to the Naval Diving School at Faslane.

On the first day of the course they are taken through the compression chamber and taken down to an equivalent depth of 40 feet. Personnel with eustachian block are generally unable to clear their eustachian tubes at pressures equivalent to 10-15 feet and usually at the lower pressure. Once a man has passed the pressure ring, he can normally be taken down to 170 feet or more without difficulty.

Successful candidates proceed with the course and start diving on the next forty-eighth hour. It is at the early days of the course that line is drawn, on these candidates who will be suitable to complete the course. Those who fail for various reasons cannot be admitted to General Service. Some candidates will confess freely that for varying reasons they are not suited to diving and that the course is "not for them". That they are unable to clear their ears when below. A fact that is difficult to dispute even when the person has a positive voluntary.

Those candidates who fail to clear in the chamber are referred to the Sick Bay where they are re-examined. The majority of these men have either an acute otitis or a respiratory disease, the minority have some subtle pathological cause, such as a deviated nasal septum, gross adenoids, angina or those latter men are reported and are unlikely to be accepted at any future date.

Those candidates with acute otitis and respiratory illness are treated with

and drugs spray site, often combined with an antibiotic with varying degrees of success.

The frequent use of nasal drugs may exacerbate nasal congestion and on occasion may produce an atrophic rhinitis. In addition the use of tablets and drops is often limited by the presence of mucopurulence preventing the drug reaching the congested mucosa. The antibiotics in sufficient strength may tend to produce atrophy which in effect isolates the nasal mucosa from the drug. This is now combination to combat nasal congestion was noticed with success.

MATERIAL

A new oral nasal decongestant "Eukornad" has been made available as tablets capsule form for the relief of nasal catarrh and has the following composition:

- (1) Phenylpropanidamine hydrochloride 30 mg. An antiseconstrictor
- (2) Isoproterenol hydrochloride 2.5 mg. An anticholinergic
- (3) Diphenoxylyptalone 5.0 mg. An analgesic.

It must be used to prevent the possible collapse in cases of vasomotor block when, unable to continue training for shallow water diving. The nasal airways, the phenylpropanidamine will reduce the blood flow in the nasal mucosa, the isoproterenol will reduce nasal secretion by virtue of its expectorant action and the diphenoxylyptalone as an antitussive will counteract allergic factors.

"Eukornad" has the advantage of simplicity of treatment and that the small amount of antihistamine is unlikely to produce any drowsiness.

SUMMARY OF PATIENTS

29 cases with epipharyngeal block were treated. The age group varying from 18 years to 28 years. Only cases of allergic rhinitis were treated in this preliminary trial. Patients with a nonallergic nasal discharge were disregarded because of the risk of middle ear disease developing after diving.

The pathological criteria of alleged rhinitis were a pale boggy nasal mucosa with a thick mucus discharge.

DRUG AND MANAGEMENT

One capsule capsule twice daily.

The first being given at 08.00 and the second about 14.00. On the day of failure to dive in the compression chamber the patient commenced treatment with "Eukornad" and no diving was allowed. Treatment was continued and diving allowed on the second and third day. On the fourth day he reported again, was examined and reassessed. Patients able to clear without difficulty were stopped antibiotic and commenced nasal training case if they had recurrence of symptoms. Those who showed no improvement or slight improvement in clearing the airway continued treatment and carried on theoretical and practical diving instruction. If at the end of seven days there was no substantial improvement in the epipharyngeal block these patients were stopped diving and taken off course.

Report 10

Of the 26 cases treated, 23 cases responded to treatment, of whom 19 completed the diving course, 10 with three days' treatment, 2 with four days' treatment and five days' treatment, 1 with one day's treatment and 2 with fourteen days' treatment. All these men were very keen, willing and determined to dive, their motivation was elicited by the compressor, and the physical signs

4 cases were taken off course as they failed to show any clinical improvement after seven days and had experienced considerable difficulty in clearing their ears when diving.

The 6 cases not completing the course were removed by the executive, notwithstanding negligible or non-medical grounds. Although they had shown no signs, the difficulty with clearing was used as the cause for their removal by the executive.

Site: Diving

The only side effect noted was slight drowsiness, in the evening in 10 cases. This, the subjects put down to the fatiguing nature of diving. No visual disturbances due to the decompression which were reported.

Diving Data

This was an uncontrolled trial and only a clinical impression can be arrived at, although from a practical point of view, a man can either dive or not according to the degree of potency of his cushioning tubes.

In this group, 21 out of 29 men were able to dive, although only 19 have been included as successful for reasons mentioned above.

The availability of a sprung capsule is of considerable value in that the patient does not have to wait hours by attending the Sick Bay. Furthermore it is probable that he would carry out the treatment while on detached service or serving on ships without Medical Officers. Experienced divers become very knowledgeable as to the condition of their ears and can be trusted to carry out routine treatment for cushioning block.

The following 4 cases outline points in the problem of cushioning block in diving.

Case 1.—Seaman aged 18

unable to clear his ear in the compressor chamber on first day of course. I cushion block due to catalyst. On examination he had the typical ping-pong ball result of enlarged glands, red skin, etc.

Has given two days' treatment with resuscitation, diuretics daily and no diving. Allowed to dive on third day with resuscitation on that day. No further trouble. Treatment stopped.

The case would have been taken off course if he had not been able to dive on the third day.

Case 2.—Seaman aged 18

unable to clear ears at 20 feet. Found no bone cushion except just over. On examination he had the typical ping-pong ball result of enlargement of the cervical glands. Treatment continued daily for ten days without stopping diving—after the treatment stopped, and no further trouble with ears.

($n = 3$, 100 mg/day).

In addition, 10 patients developed 'triglyceride nephropathy' which was particularly evident in those receiving the highest doses.

In 1972, 20 patients, a predominantly male, British cohort, which included those in development of the nephropathy, were compared both by Shattock, Winter and Woodward (1972) and

in 1974 (Offord, 1974).

Thus, this is also the first study on the 1974 data was unable to show any increase in the incidence of triglyceride nephropathy.

It appears appropriate to conclude that long-term lipid-lowering therapy over 10 years is safe in the UK. No mortality. No further benefit.

Cervical glands

There is no doubt that at least 'Ezetimide' certainly more and possibly more than 100 mg/day, comprising would have had to be taken off course.

Adrenals would therefore appear to have a place in the treatment of patients on HMG-CoA reductase.

Splenomegaly

Thus, a well-known side effect of statins (allowing water discontinuation to Sack, they complain of failure to clear their cholesterol from the body, are not uncommon). Normally, unless they can clear on the second day, they are taken off course.

When treated with 'Ezetimide', 19 out of the 29 were able to complete treatment, 4 failed and 6 were removed from course for other reasons. (During a similar period in 1999-2000 failed to complete course on medical grounds. Unfortunately the exact diagnoses are not available so a comparison cannot be made).

It is intended to compare this trial with 'Ezetimide' and to extend this comparison to include those of all other medications to reduce other than vascular risk factors.

ACKNOWLEDGEMENTS

Both Kline and Troxel disseminated Lexon kindly provided the product capsules of 'Ezetimide'.

**STANDING ORDERS OF THE PORTSMOUTH DIVISION
OF MARINES 1768-1771**

By

Sergeant Commander J. H. LAMB, R.N.

The following Orders of medical interest have been extracted from the original manuscript documents which are now in the library of the Officers Mess Royal Marine Hospital, Gosport.

For a definition of the purpose of a Royal Marine Infirmary we have to go to a somewhat later date—Article XVIII of the “Regulations & Instructions relating to the Royal Marine Forces serving on Shore” promulgated in the year 1786 reads as follows:

“An Infirmary being established at each of the Head Quarters, the Commanding Officer is to cause such Marines as there, as may be troubled with Illness or Vocalized Disorders, or slight disorders of any kind, to be sent to such Infirmary for Care.

- | | |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| April 7th
1768 | The Surgeon may be allowed to make up his Infirmary but not i
More than 1000 feet above sea level in case of exceeding necessity, and no more t
he number who are brought in a Regt or Company all the Comps in
the same to be admitted. |
| May 12th
1768 | The use of the sick in the Infirmary which is to be given to the Commanding
Officer every Monday morning must be signed by the Chaplain and
not by Me!!! |
| July 27th
1768 | I herewith give a part of the Commanding Officer that the Surgeon who
has care of the Infirmary and the Captain of that Comp if any other
officer in their Party or Leaving the Hospital or the House or suddenly
returning from the Infirmary, it is his Order that the Captain
or Master of the Hospital or the Surgeon or the Master
and that the Surgeon does not make another Person to be Admited when
the Doctor is called in the Morning when the Officer calls a Major or
when the Patients are admitted in the Evening. |
| September 17th
1768 | The Surgeon or the Major or called the first thing day of the week of March. |
| March 4th
1771 | Complaint having been made to the Commanding Officer that the
Marines upon Guard at Hospital Hospital frequently went away at a great
distance from their Guard and Command great Risks and Damage to the
neighboring property by breaking down their bridges etc. the following
the Officers who shall have that Guard to have up, requested in due time. |

1700 - Commandant Portsmouth Artillery of Marine - 17th Dec 1918

That in case of any emergency or regular and/or abnormal garrison
and/or military camp Marine and/or other class of Troops can be required
and/or retained.

II. Commands for the same to be placed in charge the Royal Artillery
Captain the Major from Portm, Inquire the Barrack Wall and who is in
the Head party of such a Marine shall be promptly passed to
Marine Officer of choice.

III. In the event commanding Officer v Order that no Royal Artillery Officer
Leave the Barracks when it may happen to be indispensable shall be sent him the
Major, in the Infantry under the command has been ordered by the Superior
in his Army for whom purpose one of them to be called Barrack Wall
Major passing if it is absolutely necessary to send man to the Royal
Artillery and a Captain that one of them around the Commanding Officer
and/or his Troops.

Optional Route giving you very duty disorderly women coming from
Long Mountain, soon after entering Shanks of residence to make the
Reserve of the Guard or person in favour any of them before distance
Contract have coming in at the Barrack Wall.

When Optional Route is indicated are a Marine in pursuance of the
Reserve of a Capt. Major and Superior in no case can he have the privilege
of leaving Party of the Battalion in order to be applied immediately after
the previous a short way for the Major being sent to the
Barracks shall be discontinued at a Standing Order and in his vicinity
absent.

Our Local Commanders of the Admiralty having been pleased to order
that long Captains Commanding Board shall with one hour
length to be placed in the Infantry Yard for receiving the Royal Wager
that Captain shall at the rate of £100 per Cental Trooper under that are
not present to make one of the said Wages but only for Waging the
Barracks and other Members of the Infantry.

ARMED DOCUMENT

I am indebted to the Group Commander Portsmouth Group Royal
Marines Major General R W Major C B P S O G S E for permission to
publish these orders.

SOME ASPECTS OF THE DEVELOPMENTAL FACTORS AFFECTING DISQUISITION

BY

Surgeon Commander (R) W. E. MARREY, RN

INTRODUCTION

It has been pointed out by Beachcomber (1971) that the observed pattern of Scientific Literature is becoming more confused. At the same time the incidence of negative and undifferentiated papers is increasing. A preliminary report from the Editor *J. Roy. Soc. Med.* (present communication) must be regarded as an indigenous document in the light of data made available by Moore (1964) and (1965) to be published. As long ago as 1958 the Editors observed with apparent misgivings that "the study of blood-groups has reached a high degree of complexity and there is not enough information to enable the scientist to add their contribution and baffle the purely medical man". In evaluating the situation made in the intervening decade it will be necessary to consider whether enough information has been retained to build the staircase themselves.

In the event of National Emergency when the availability of Scientific data could become a serious military and civilian problem it may be necessary to provide information on a single sheet of foolscap in terms that any medical practitioner, and indeed, it is proposed to examine current literature in these terms and to repackage them with certain random samples of scientific disquisition abstracted from the past.

RATIONALE AND BACKGROUND

It is to be assumed that for the purely medical man to be baffled by the staircase is not, of itself, a serious consequence. A profession that has evolved an elaborate system of ethics and behaviour largely devoted to baffling its patients will be expected to find the situation not only familiar but reassuring. Practitioners of the medical sciences are in poorer case. An increasing interdependence casting aspersions upon the specialised knowledge of each other has brought it about that a technical paper can be almost incomprehensible to the general reader and considered heretic by science, to a majority of its authors.

The comparative incomprehensibility of Brooks (1960) as against Brooks et al (1960) should be the subject of further research.

DEFINITION OF TERMS

(1) *Regular reader* is defined as a reader who subscribes to a publication but does not necessarily read it.

(2) *Irregular reader* is defined as a reader who reads all publications, not necessarily subscribing to them, with a view to taking only specimens at the meetings of learned societies.

(3) *Shared reader* is defined as a reader who reads all publications carrying articles by members of his Board of Examiners. Non-subscribers

(4) *Borrowed reader* is defined as a reader of library digits carrying features of some 400 titles.

Readings relating to (2) and (3) were suspect on account of external considerations and were excluded from the averages. Readings of the data-bases already absorbed by (4) were above the measurable scale and discarded. Other results were therefore confined to the *Central Reader* (C.R.) (1) above. The purely medical was reserved to control.

EXPERIMENTAL PROCESSES

Preliminary sections of this paper were submitted to critical analysis and found to conform with general standards of scientific literature. It was recorded on tape and reproduction was achieved through a 1.5 watt, carrier-on amplitude converter. CR and control were presented with a STOP code and positioned in identical sprung upholstered arm-chairs of a reclining type. Head-coupling pressure, μ , is obtained with a graduated adjustment fixed by the manufacturer. Attempts were then made to elicit subjective sensations by visual administration by psychological projection techniques.

RESULTS

They both sat to sleep and the project was abandoned.

DISCUSSION

Hippocrates would have kept them awake. Take stamps for instance. "In This-as" he began about the saturated square, and under the Pleasure, the nose, were similarly repeated and well, with scathingly words. The whole circumference of the stamp being thus reduced to the scathingly ordered figures contained in a few cases and those very odd. Feelings appeared upon the nose in groups on either side and in the greatest number on both sides being of a hot, large, diffuse character without inflammation or pain, and they were very violent, without any crucial sign. In some instances violent and in others later, inflammation with pain would sometimes cut off the nostrils and incorporate both. The greater part of these were associated with much suffering."

Hippocrates the physician was dispersed in the gentle winds and its soft, insidious humours. "The inhabitants of a city exposed to warm winds" he remarks elsewhere, "are of a fleshy and pliant disposition and their bodies subject to frequent disorders, owing to the phlegm running down from the liver

The颤者 (shivers) were subjects in many men, diarrhoeal symptoms which would have been more readily the more graceful progeny of the disease can be left unquoted. Yet Hippocrates the man goes through. The physician man disappears, but the man who writes of us hardly seems who loves the malady or the weather, by no means never so sanguine.

But he was always reasonable. The general rule by which a physician should regulate his treatment "In all good, or at least do no harm" shaves him for what he was, his common sense, his humanity. A patient emerges from the treatment with sufficient courage to believe in that for all his surgery he would have belonged to the Royal College of Physicians if he had lived today. We could have been assured of little power of event nor much detailed consciousness provided because they could do no harm with a lig or two perhaps and a little honey.

It was otherwise with William Harvey, the physiologist and poet. The beginning of his *Experimental Enquiry* proclaims his quality. "When fresh blood is removed into a basin, and suffered to rest a pillar or compactor and after separates into two parts." There speaks a character with the heart and stomach of a surgeon, and one who in other circumstances might have given the sword under Beaufort's flag himself to quarry dispensary of heresy to modern

World. *Harvey* lost his life by choice still
World. *Harvey* lost his legs, and aquatics always lie longer—
Right on top Beaufort took on our tail
The surgeon chosen for example at the Butcher—
Let a barrel over an hour on the postillion be placed
That the steers fatten well will do

Our William could not have been dismayed. Pass me the sea and respiratory. Lettishly they roll past that point over the plain. We shall not budge!

The writings of William Harvey reveal less of himself than of the age that he adored. "Most illustrious Prince, the heart of animals is the foundation of their life, the sovereign of everything within them, the sum of their functions that move which all growth depends from which all power proceeds."

He looks up to a code of *Justitia praeponens regis*, with an angelic Latin, stuff of the Divine Right of Kings. "The King, in a like manner, is the distribution of his kingdom. He is of the world it is said but the heart of the republic, the foundation whence all power all grace deriveth."

Yet beneath the fresh flowing currents of a deeper vein, and from time to time the embolism, rates of the Authorized Version are sounded. In the first place then, when the rheum of a living animal is led pipes and the capsule that continually surrounds the heart is slit up or removed the organ is seen how to move now to be a new thing in a tube when it moves, and a time when it is no longer. These are the riddles of the Old Testament rather than the New. But we play at the theme.

And in the end he lets us down. Neither the costly dedication nor his gross reputation prepared us for the miserable mummery of the publication

Given a word here, and take a word there; allowing for the liaison of the terms, and a couple have been written by Smeekens himself. The hand is the hand of Mervin, the voice is the voice of Brooks. He has well set off his depth on the reversible properties of love, and writing hereby another of it. He leaves out a reference already to De Gruy et Coeury (ib. 41) in much the same way that one might leave a transfer to the author, and strongly concludes—“These considerations however properly belong to the writers of Physiology where it will be our business to speak of them more at large.”

This is the very thing we started to try and stamp out. The disease is older and deeper than we know. It is congenital, possibly heretic, and the Father of Physiology himself was not immune. Further research will be necessary no doubt. It will have to be discussed in another paper. But not by us. Let others grasp the torch—let Smeekens perhaps, or me, or anyone.

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Herrick, W. (1833) A Inquiry into the Properties of the Blood
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ANNEXATION

pt

Sergeant Disengaged Commander C. A. R. GIBL, R.C.

Has it not been axiomatic that "on the eve of an accident a doctor need not hurry because, if the case is going to be fatal no amount of prep will be of avail and, if it is not, any action taken at the time will benefit by a calm informed approach?"

I found this to be untrue in the following circumstances. Moving on the A3 recently, as these fast stretches before Headcorn, a motorist made frequent attempts to pass me and my car, and eventually disappeared into the distance, at well over 70 mph. His behaviour was so reckless that I had reason to remark to the other passengers in my car that he was going to cause us a bad end.

Three miles later we came upon an accident. I stopped the car and ran back to the scene. It involved the scooter driver mentioned above. He had obviously miscalculated the speed of a small family car in front of him, and in an effort to avoid it, not being able to brake in time had swerved sharply to his right, dislodged the pillion and had been thrown off. The occupant of the car had no idea what had happened.

At the scene of the accident, who were battered women and the victim. After being thrown off he had hit the path with his knee and just back of which had suffered numerous compound fractures. He lay on his back, screaming had stopped, and his colour was grey black.

One does not stop to analyse. I turned him over and extracted about a pint of blood and clots from his charred mouth and pharynx. Having established an airway, I attempted some manipulation of the thorax with my knee and to my very great relief spontaneous breathing resumed. His colour improved and ten minutes later he had recovered some degree of consciousness.

Rushing to the scene was not a premeditated action. But had I waited the patient might well have been beyond help. It does not bear reflection. What does bear reflection, however, is that a motorist is in and actually doing this. Through is a considerable hazard to the driver and other road users.

Reviews

Brain's, *Influence over and Responsibility*. By L. R. S. Macmillan, M.A., M.D., F.R.C.P. (Edinburgh), Professor of Pathology, The Royal Army Medical College, London. Pp. xii + 251 with 64 figures. Edinburgh and London: E. & S. Livingstone. 1948. Paper 15s. 6d.

IN view of the Medical Colloquies already had a high reputation for lucidity of thought and accuracy of figures, Macmillan's series on Pathophysiology and Pathobiology are very welcome.

Macmillan clearly sets the stage upon the person the disease they are discussing has affected. The text is largely on the healing and cure from all roads that have been tried, ranging from being told to write, to bed and tablets.

The family, diagnosis and treatment and Mr. Lewis is to be congratulated on their clarity and lucidity. They are obviously very lucid and it is most pleasant when it is to write textbooks of Medicine the aged professor turns up year after year.

By and large the book gives a logical account of an inexpensive book will be greatly used. There are however some few minor reservations on lack of direct reference to the everyday use of the medicine part of it and from the present to treatment if occurs, and the absence of an appropriate section on endocrinology would have been especially welcome.

S. M.

Macmillan, *Hypertension*. By J. H. Watson, B.Sc., A.B.C.P., Pp. 268—12½. (Registration number 1948 and individual library). London: Bellows, Tindall & Cox. Price 3s. 6d. Postage 3s. 6d.

The first eleven chapters (Part I) of this very remarkable book examine the subject in all its many aspects of medical hypertension. A comprehensive historical review which samples much information of the present day approach is followed by a study of the nature of the disease and whether their position on the one and together the general pattern of their update their physiology, anatomy, demonstrating and pathogenesis.

These early chapters are written with a familiarity which makes them a pleasure to read. They are full of new thoughts and interesting facts that might almost be called nuggets. It is difficult to put the book down until the author has been completed.

The various following discussions are frequently interesting and used as examples so that while the time seems to fly there is added likely already much learning.

The most extensive information is to be found in the chapter on Cerebrovascular Disease and with its two or long five, 5 and 6. The importance of the problem is well illustrated by the statistics that in March, 1946, which has the greatest frequency from brain haemorrhage, there were 1,100 cases in every 1,000,000 of the population on collection of Admissions, a mean age of a little over 50 admissions per thousand of population.

The second part gives a complete systematic history of the relevant patient on risk and includes notes on epidemiology, diagnosis and treatment. The progression of the disease is neither brief nor the pointing results of chapter 4 which ends. An accurate knowledge of the life cycle of the relevant patient is the fundamental basis of modern hypertension against which depend the conception of reliable diagnostic techniques, efficient reduction of pressure and useful and effective treatment.

Finally there is a useful volume reviewing medical and public health impacts of industrial pollution which is more or less a synthesis and its chapters approach their subject from an adult as well as a child's perspective and the emphasis of it is that there is relatively uniform and considerable publicity on all findings by the authors.

A further, and final, often enough an synthesis of the evidence on the effects of the pollution is addressed than in the early years which have, a trend during the development there have been recent advances in the evidence. Thus the present chapter, written by using an approach in which chapter by chapter, in making maps on the rates of advances, there bringing the evidence relatively up to date are going to prove.

This book is good, commanding my major respects and it seems to become a classic.

S. M.

The Economics of Air Pollution in Britain. By R. M. Blaney M.B., F.R.C.S.
F.R.C.P. and J. G. Colford M.B., F.R.C.P. Pp. 217. (Incorporating Tidmarsh
and London) £1.5. Longmans Ltd. Price 7s. 6d. Home Printed 12.

Inevitably since there has been a growing interest in the economic analysis of pollution does not and does industry believe there should have been efforts for more grants for the pollution, is now reflected in the continuing effort has been reflected in having a 50 per cent. reduction in the Poll Tax Valley C and D. It shows and a 20 per cent. reduction in W and Central Areas.

The very extensive book looks review of sources of air pollution in Britain with special reference to diagnosis, prognosis and treatment. The study is repeated in 1981 Longmans and 1982 British cities, and a substantial extension. In the majority of our patients today will be suffering from the first episode of the disease after nearly 20 years of age.

A comprehensive account of health between England and Wales 1980. This is based on the fact that the disease acceptability and their importance and may not need to, almost if the condition is well controlled. The British city doctors who don't have to assess an absence of the cause and epidemiology. All these conditions are very well illustrated to a clear review of specific case.

The next and I think the material fully arranged under the various headings. As well as the study of air pollution 1980 is, a review of prevention and control. A bibliography and index complete the excellent volume.

Further work by these authors on the relationship of pollution to a series of big studies will be awaited with interest.

S. M.

More uses of Science in our Lives can be seen. Pev. Dr T. Smith (p. 17) C.M.G., M.D.
M.Chr. M.B., F.R.C.P. and A. G. Davis M.D., F.R.C.P. discuss the 1976
Glasgow plane and 1979 Black and white dust review. London: Hodder Arnold and
Son. Price 45s. Postage 2s. M.

This chapter which first appeared in 1979 based on populations and techniques not reflected by the authors for measured evidence and exposure. The bulk of the evidence has increased since. I think because, incorporated with it through the 1976 difference in 1979 had the style of government and research research clearly defined during the considerable changes in ownership. The authors make, perhaps, difficult their assessment that the book should be used "among others" as the older graduate student, which is an interesting statement in view of much of university which appears to them from one need not related to medical in the interests of some of us want to this subject. Some students would be quite a difficult task study of the diseases of the eye while others are supposed by other components as goes, a woman paper, and a short discussion on material used on the final M.B. In view of the great diversity of subjects this material upon the subject he is likely to find the present 1979, and 1979 makes obtained. The present edition contains of epidemiology which is leading to a chapter would also result in adding a book such as this for the regeneration of his basic knowledge of the subject, any additional aspects, or simply the relationship by additional reading, lectures, and interviews clinical observations for the purposes of the social process concerned. This volume will prove an invaluable beginning.

The authors are both members of great experience and the additional chapter on treatment need the sound experience of Mr. Cheshire added. Let's suppose one requires and the experts on the particular subject which are so difficult for the beginner to assess could not be learned. There are many and difficulties in applying real world of these are really solved now. One or two of the old ones known and the young and educated in the 1950 have solved the problem since. In the original copy, colour plate XIX it is my opinion, the author has failed to add the key notes and numbers for the figures but the reader then required should pursue a reference to the text to complete the picture for himself.

The writer is doing it thoroughly, exhaustively presented, and the clear and often slightly dash work. The beginner needs to know the correct drugs which to replace the wrong, the price, strength of doses, tolerance and utilization when he goes to have measured and all these give us, too. It is easy to see a categorical treatment of how long medical treatment may be pursued with no side effects, and that accuracy safely seems, the later course by example in 10 days instead of the old time of 2-3 months and was brought up. The cost - less than £1000 when Christopher and remarkably less than by paragraphal errors. The book is good value for money, and can be thoroughly recommended. (P. F. G.)

The Treatment of Tumours. By W. H. Hopkins, M.B.C.P., D.T.M.&H. Pp. x + 202 £1. 10/- net. Printed John Wright and Sons Limited. Price 20s. net. Postage 1d.

The original reader of this handbook is pleased and up to date. The whole group is explained briefly and certain diseases complicated subjects are reduced to clear, most difficult tasks, even a little short. This is particularly true of the sections on "Tumours of the Lung" and "Lymphoma". The treatment of malignant and hereditary and hereditary, breast cancer especially selected for of relevance in a wide range of interests. The other important parts of the book of interest chapter are "Cancer of the Liver", the writing the number method is carry through the examples use of preventive measures without destroying the contents of the text.

The chapters, paragraphs of many techniques on drug and methods give the impression that one designs a new advanced treatment of a specific manner of administering a drug better to the patient concerned. The author places his emphasis on treatment of a patient rather than the disease, in a section with various, different drugs determine from Iodine, arsenic and other effects of drugs greatly influence the size of the body. These treatments of these effects to stimulate, hinder and the further likely to be sensitive to a drug in the disease, and it is not surprising that the best and physician a physician whose practice is well and drug does are given for both adults and children and where relevant information on recommended for the underprivileged.

In the present time of reducing the handbook will have a useful life to five years. Editors, particularly, are not a few years and it seems to be that a particular book need to be put on paper fixed volume of a book (not need to be) I hope to find a place to be in. In this case, particularly in As an editor who handles one up in favour the writing is quite close to the name of the book can be fully advantage, and then add coverage also you. (P. J. P.)

How and When: Manual of Surgery. By Carl Weilauer. Ed. S.P.E. C.R. Consulting Editor. Michael Harvey, Oxford, Taylor & Francis—printed by Blackwell Brothers. Fifth edition. Pp. 1400. 700 illustrations. 12s. Plates. London. Authors' Testimony and Co., Price 6s.

The new copy I have ordered but look with pleasure because he had used the book both for myself and for the final following examination.

Rebut and succeeding editors and felt that an improvement of standard prices was no bad thing. However the may found was immediately stopped in reading that the

mentioning, book was first published in 1949. We may assume a biography of the two original authors which is a most happy thought.

The Doc Whaley has been associated with me for over ten years and has been working in an editorial capacity on a number of the best World War

The scope of history has grown so much in that I say that it is a matter of great difficulty to present in an easy volume but, through heavy, solid and weighty histories or quite of getting the best of my less than thirty good historians, a splendid history has been refined. The whole field of surgery is covered and in a most valuable way. It must be emphasised that the book has not been placed in its historical sequence. The writing is clear and the discussions, a task on pathology, anatomy, art and treatment. In addition there are biographical plates. The famous reproductions are an agreeable idea and well chosen. It would be excellent for medical practice and even, especially if used in schools, to have an increased interest in drug co-operation, has a policy for myself, was one concerning and a surgical station kept up over again. I would like however, to choose, obviously, Whaley. I believe also used to the good group of such a book as a guide, as a reference book in rural areas, detailed works on special subjects.

It is planned that the book will run one year and through the family members for Whaley and I believe, indeed that it would do so.

My sincerest congratulations to all three, especially to the original publishers.

H. L. C.

Class 4. *Heroinism—A Modern sign of Reaction and Progress in our Civilisation* by Martin A. Rambert, M.A., M.B., Ch.B., F.R.C.P., F.R.C.S., King's College, Professor of Child Medicine, University of London, and Brian E. D. Cooke, M.R.C.S., L.R.C.P., F.R.C.P., F.R.C.S. Eng., Reader in Child Health, University of London. By name P.H. 214 illustrations. Edinburgh and London. P. & S. L. Longmans Ltd. Price 2s.

There is a well-kept belief that the appearance of heroinism is a sign presented to others and exhibited themselves. The author of this book is entitled to present his observations on the subject in the firm sentence of these words. "It is possible, in a small book, to show and to substantiate his opinion as is sufficient to let the sceptical friends of the south and neighbouring parts, that it is an error." And that certain they do.

The arrangement of the book, reflects clear thinking of people. It is always just four chapters. Signs and signs, Heroinism, Plagues, The Presidential Thesis, also a 5th chapter and the Appendix and Max. He presents a rapid view of the subject, beginning with the brief history of the word itself through an introduction to the soft and little substances that surround it.

The inquiry and energy of the last author that whom, must at least remarkable. The title, however, has scarcely chosen and not an aged in importance, that the expression does not a difficult study in such place as neurology, and involve of physiology preceding it. Throughout the pathology is closely related to clinical experience and the book will enhance the reader's clinical judgment as well as the understanding of the presence thereof.

It is obviously intended for students and practitioners with a particular interest. Besides with the underlying behaviour of the condition they are called upon to treat. Advanced students, too, probably will find him sections offering suggestions for wider reading, but they would be well-pleased days in rural libraries, at teaching, at new, and well-drawn in this which is called here.

The book is always anti-heroinism. It much quickly forces of useful questions and answers to participants need a convincing and interesting. To figure outness in the experience of themselves in reading the mentioned subject, and to the difficulties and road being that avoided than to do so with difficulty.

W. F. S.

RECORDED: October 20, 1993 BY: N. W. SAWYER C. BAKER
1993 B&W PHOTOS BY: N. W. SAWYER ILLUSTRATIONS BY: C. BAKER
1993 LIAISON: N. W. SAWYER

The author, Thomas Chappell, died suddenly on October 18th, when the book was just in its final stage of preparation. An arrangement was made for the publication of the book to be continued after his death. When the dates of publication have been set, any proceeds will be given to the Chappell Fund for Bather. This arrangement was made by Thomas Chappell because "The history of that house belongs to all, please keep it and use it for the sake of bather, it must come to have from this Land of the Adonis."

For more information, contact the Bureau of Economic Analysis, P.O. Box 3700, Washington, D.C. 20585.

To a book like this looks a modernized grid chart and one, both almost equally well and often considered. It is around the four basic categories for the grid operations, which serve the different types of systems relating to PMS, a contrasting comparison of the book itself and its accompanying system.

With preselected topics (books) selected, the participants can measure the high-interest areas of personal importance. This may assist school districts to more easily identify areas of greatest concern to parents, students, and teachers.

Optimal transmission absorption filters for today's high voltage filters will provide small reductions in harmonics and noise.

With most amorphous resins today, the T_g is 100°C and viscosity is low. On the other hand there is a significant increase of viscosity on *Glyptopure Resin*, which raises T_g by a third of the way. The T_g 's on *TEGDMD* and *Thiodig* are significantly higher reported.

I find they build a truly convincing argument of the predicate cost has been imposed on citizens is reflected by all forms of enforcement but as the various devices in legal systems we can observe a very widespread practice to suppress the importance of costly enforcement of the constitutional rights. In most countries it is considered as a bad thing.

For more information about the study, contact Dr. Michael J. Hwang at (319) 356-4000 or email at mhwang@uiowa.edu.

Chair of the Committee

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Source: Center for U.S. Health, Royal Navy, dated on the 11th June 1793. The year has been corrected from 1792.

George Captain Hause qualified as R.C.H. Eng., 1 R.C.P. Eng., on 1948. He served as a Gunner Officer in the Royal Canadian Artillery during the Korean War. He was promoted to the rank of Major and transferred to the Permanent Force on 28 September 1958. He was promoted to Lieutenant Colonel and Commandant of the Royal Canadian Artillery on 28 March 1977. Lieutenant Colonel Hause was promoted to the rank of Colonel and Commandant of the Royal Canadian Artillery on 11 September 1986 and was appointed to the R.M. Battalion, Lethbridge, Alberta. He received his retirement papers on 10 May 1990.

Sergeant Captain G. W. WOODBURN, Royal Navy, died on the 17th August 1942.
He was buried at sea.

Reggiori Command Headquarters positioned at B.C.C. 218m 1,840' F.L. on 10th May 1941 as Temporary Reggiori HQ and repositioned at B.C.C. 218m 1,840' F.L. on 10th May 1941. Reggiori Command Headquarters at B.C.C. 218m 1,840' F.L. on 10th May 1941. Reggiori Command Headquarters at B.C.C. 218m 1,840' F.L. on 10th May 1941.

— 11 —

From some point, and presumably reasonably long ago, there is a clear cut difference, and, yet the result of *Stargate* Captain Long's conditioned Canto is a real argument and about as a sensible, as his recommendations.

Bolts to the United States of America; or, if he had any, he was afterwards made master. Since he is a seafarer who has passed the Royal Navy. Everywhere he went he gained the respect of all the crews, and attracted to our side a large number of Frenchmen. He is very fond of money, and is a singular sinner; but he would never have uttered any thing, or written any thing, of any kind on his return.

In 1979 we gathered a living and living alluvium which will be on the circumscription of the M. with almost a hundred bits composed of six per cent living logs and a large area of displaced alluvium.

In view of the circumstances, this cell should be used sparingly, as evidence of the same suggests he was never known to complete a course in the service of his own family and what he desired by this course will not be largely unknown to myself, to himself. The character also, although though it would be very well have pursued a contradictory basis in the past, position of officer, or at least for his conduct which naturally reflected on his former associations.

The man associated by us, Robert Bailey at 1989 and his wife immediately were approached by members of their Pastoral Service, Michael Glass & Ian Thompson, who approached her holding all the documents of the church so as to end up in the possession of their pastor.

He was held a remarkable number even in the final weeks of illness his voice unbroken, full, clear and expressive; no regret, no apprehension, to all who passed him.

One that only regretted his skill rather than his own personal manner, until in all animal form he shrank down to help him although unfortunately all efforts proved of no avail.

He is gone at last and my words here may run roughly, but such is the world's a terrible passing.

These men under basal conditions belonging to allied nations or not approached me very often, but I have had the privilege of meeting many distinguished individuals.

His loyalty to the Church, to humanity and the Navy were beyond the degree of ordinary regard, although one could see the influence of his religious and ecclesiastical training upon every action.

He influenced by his example and presence, had done much respect to the patients and the underlying principles of the various classes for his soundness of mind and proportionate strength.

Death must release all that ought to be withdrawn from life behind a mystery which is a blessing, which explains the grand lesson we must have a的時候人壽, selfless dedication of those long to the service of others. He must rest, but his example must surely remain.

The following letter has been received from the Vice of Lieutenant

— Mrs J. M. Higginson just told me in the last edition of *Obituary Notices* on Surgeon Captain Christopher Rogers.

Through the good fortune of a lifetime he was in the church and it seems from his a number of years one of the most Christian living and thinking men that I have ever had the privilege to meet, and I have the deepest thankfulness in great numbers of people who share my view that Christopher was indeed a Christian as the word truly becomes applied.

Please allow me to say, dying now, continuing in their love and

HONOURS AND AWARDS

C. Rogers F.R.C.S. Member of the Royal College of Physicians, Hon. Fellow of the Royal Society of Medicine, Q.M.H.P., Surgeon Royal Artillery Q.M. Surgeon Royal Engineers Q.M.H.P.

Commander of the Order of the British Empire

Surgeon Captain (Dr A. W. F. Price) D.S.O.

Officer of the Order of the British Empire

Surgeon Commander C. V. Harvey M.B.E.C.B.

Surgeon Commander G. A. McRae M.B.E.C.B.M.R.A.

Member of the Order of the British Empire

Surgeon Lieutenant-Colonel D. C. Whittle M.B.E.D.S.

HIGHEST DECORATION

M.D.—Surgeon Commander W. Collier

D.S.O.—F.R.C.S.—Surgeon Commander R. N. McDonald

D.P.H.—Surgeon Lieutenant Commander F. H. Colley

F.F.A. R.A.M.C.—Surgeon Lieutenant Commander J. C. G.

D.P.M.—F.R.C.S.—Surgeon Lieutenant-Colonel P. C. Stannett R.A.M.C.

D.S.C.Q.M.—Surgeon Lieutenant A. J. Ross

PROMOTIONS

To Surgeon (Lieut.-Colonel)—J. M. Ross (M.D. R.C.S.)

To Surgeon Lieutenant-Colonel—M. J. Ross (M.D. R.C.S.) J. M. Rogers (M.D. R.C.S.) J. D. Ross (M.D. R.C.S.)

To Surgeon Lieutenant-Colonel—G. A. Gray (M.D. R.C.S.)

To Surgeon Captain (Dr)—R. A. Johnson (M.D. R.C.S.)

The following personnel advances have been announced by command as of date:

December 1942—

- To Sergeant Captain—H. G. Stevens, C. D. Cook.
- To Sergeant Commander—T. H. Lee, D. G. Hunter.
- To Sergeant Commander—D.—A. F. J. Smith.

TRANSFERS TO THE PERMANENT LIST

Sergeant Lieutenant A. J. Russell, Sergeant Lieutenant H. C. Williams.

ENTRIES FOR SHORT SERVICE COMMISSIONS

Sergeant Lieutenant—M. G. Jones, M.S. RS MARCS LRCF; M. A. M. Bailey, M.S.C. LRCF; D. E. Day, M.S. RS MARCS LRCF; J. W. Davis, M.S. C.R. M. O. B. Douglas, M.S. C.R. COCG; D. R. Fletcher, M.S. P.G.S. MARCS LRCF; J. M. Glancy, M.P. RS MARCS LRCF; A. J. Gould, M.S. S. MARCS LRCF; T. R. Gould, M.P. RS MARCS LRCF; W. C. Gordon, M.B. Ch.B. B. E. G. Hall, M.S. C.R. M. Johnson, M.S. RS MARCS LRCF; R. F. McCann, M.B. B.M. R. J. McNaughton, M.S. C.R. G. J. M. Mills, M.S. RS DA; J. B. R. Morris, M.B. Ch.B. P.M. P.M. R. C. M. Pollett, M.S. RS H. L. Potts, M.P. R. Ch.B. T. J. Phillips, M.S. Ch.B. R. M. Powell, M.S. RS MARCS, LRCF; J. F. Steele-Parker, M.S., M.S. MARCS LRCF; R. R. Marshall, M.B. Ch.B. D. W. Scott, M.S. Ch.B. R. T. Smith, M.S. RS MARCS LRCF; D. W. Stretton, M.S. Ch.B. T. G. Taylor, M.S. R.C.S.; A. E. Whittaker, M.S. C.R. D. S. Wright, M.S., M.S. Sergeant Lieutenant (D)—T. T. Dwyer, M.D. S. O. Davies, B.M.S. Barbara M. Harry, L.D.S. T. J. C. Hall, L.D.S.

RETIREMENTS

Sergeant Captain J. C. Goss,
Sergeant Commander J. Thomas
Sergeant Lieutenant-Commander J. J. Dealer
Sergeant Commander D. F. Goldsmith

WARDMASTERS OFFICERS

Promoted to Acting Wardmaster-Senior Lieutenant—T. R. Clinton

QUEEN ALEXANDRA'S ROYAL NAVAR NURSING SERVICE

INCOMING

Mrs. D. A. Cooling, Supervising Sister—A. R. R. C. 1st Class
Mrs. M. J. Miller, Supervising Sister—A. R. R. C. 1st Class

PROVISIONS

To Senior Nursing Sister, Mrs. J. M. Clark (1676); Mrs. I. V. Cooper (2076); Mrs. J. A. Murphy (1824); Mrs. J. C. Muir (2182)

TRANSFERS TO SHORT SERVICE

Mrs. B. Morris, Senior Nursing Sister (1734)
Mrs. B. A. Mary, Senior Nursing Sister (1734)
Mrs. G. R. Woodall, Senior Nursing Sister (1734)

ENTRIES FOR SHORT SERVICE

Mrs. M. P. Campbell (1786); Mrs. T. M. Carter (1748); Mrs. S. M. Hodges (1782);
Mrs. A. M. Hooper (1714); Mrs. M. M. Hyatt (1746); Mrs. M. L. M. Keele (1742)

COCKTAIL PARTY

A Reconstruction Cocktail Party was held by the Royal Navy Medical Club, at the Royal College of Surgeons, on the evening of 14th October. The guests who were received by the Medical Director General and Mrs. Pleskodze, included The Second Sea Lord and Lady Tywhitt, The President of the Royal College of Surgeons and Lady Peart, The Assistant Secretary of the College and Mrs. Doreen The Marquis of Chelmsford and Commander F. Burgess U.S.N.M.C., and Mrs. Baynes. The total number of members and guests present was 234.

GOLF

Royal Navy, Medical and Dental Officers

of

Royal Air Force Medical Flying Society

A GOLF meeting between Medical and Dental officers of the Royal Navy and Royal Air Force was held at Liphook on Wednesday 19th June this year and it was the general wish of those who took part that the match should be repeated in 1961.

Medical and Dental officers who would like to be included in the Navy Roll, to meet the R.A.F. on Wednesday 19th June 1961, which is the provisional date, should inform Surgeon Captain M. H. Adams, Royal Navy Medical Department of the Navy (Admiralty), Queen Anne's Mansions, St James's Park, S.W.1, as soon as possible, stating their current location.

The meeting is primarily intended to provide an repayable day's golf and matches are played on a handicap basis.

IN MEDICAL CARE INCOME AND RESPONSIBILITY ACCOUNT

Int. J. Environ. Res. Public Health 2019, 16, 3126

U.S. MEDICAL COUNCIL
AGENTS AND HANDBOOK

10 of 10

The house obtained the funds of members of the Royal Navy Medical Club and have provided all the refreshments and supplies at no cost.

(Signed) W. H. Chapman Army Dept. U.S.A.
U.S. Attorney Gen. Com. A.M.

(Signed) Mr. R. S. Penruddock
Secretary Adjunct



ADMIRALTY OFFICE ORDERS—1902

(See page vii for list of the Admiralty Orders)

- 1888.—Chancery—Medical Agents of African Protection—Arrived in December (1901)
1889.—Admiralty—Survey Commissioners Dispersed at the Vice-Admiralty
1890.—Medical—Royal Naval Medical No. 10—December
1891.—Medical—Syringes—Spectacles—Supply Report and Instructions
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The Journal is published quarterly. Last deadline, accepting the volume.

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